

Farm Chemicals

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of the Industry

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Shipments . . . 37

Iodine
Pesticide . . . 41

Vynor
Process . . . 45

n. Ind.
Exposition . . .



Vol. 119 No. 1

JANUARY 1956

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Farm Chemicals

JANUARY, 1956

No. 1

Vol. 119

Pioneer Journal of Farm Chemicals Industry, Est. 1894

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In this issue . . .

Although full scale shipments from the new Sohio Chemical nitrogen plant at Lima, Ohio were not scheduled to begin until this month, a carload each of four products was released on December 15. Release of urea is set for February, followed by CO₂ in May. For a description of the industry's newest nitrogen source, see the article that begins on page 37.

PVP-Iodine is an intriguing organic chemical offering distinct possibilities in control of soil pests including wire worms, symphalids, grubs, nematodes, various diseases, etc. The parent PVP already is used as an additive in crabgrass control formulations. For a discussion of the material and its applications see page 41.

Although bone products may not seem a particularly fresh subject, from England comes news of the new Vyner process for degreasing raw bones. Big advantages are claimed over present methods as outlined on pages 45-46.

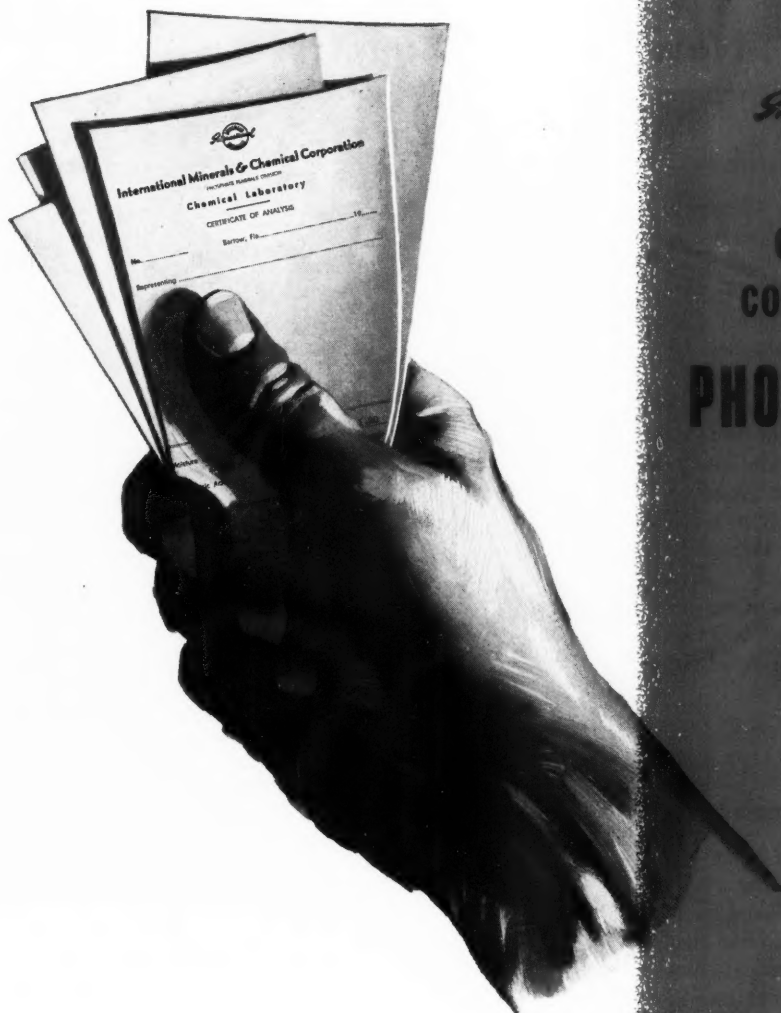
Your editor spent a most interesting day touring the Chemical Industries Exposition held in Philadelphia last month. Pictures in the spread on pages 50-51 include some familiar names, prominent on the floor of Convention Hall.

Also in this issue are brief features on tax savings (page 47), NAC '56 outlook (44), phytopath papers (49) and a CFA sales panel (52).

Cover story

Workmen install rigid cellular glass insulation in one of four anhydrous ammonia spheres at the Tuscola, Ill., plant of U. S. Industrial Chemicals Co. The light-weight material was impaled on small pins spot welded to the sphere plates, joints were sealed and asphalt cut-back brushed on. Operations in sequence avoid scaffold moving.

FARM CHEMICALS



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Business & Management

.. News of the Industry

Greening Retires, Shell Distributor

Retirement of Paul Greening as a West Coast Shell agricultural ammonia distributor has been announced. Greening's 19 ammonia agents became direct distributors for Shell on the first of the year.

He played an important role in pioneering introduction of Shell's direct application inventions and the firm's Ventura plant was built primarily to serve his organization, the Greening-Smith Co.

Greening will continue to act as a consultant to Shell on marketing of ammonia in southern California.

Kolker in Methyl Bromide Production

Full scale production of methyl bromide has begun at the Newark, N. J., plant of Kolker Chemical Corp. Packed in regular one-pound cans with two percent chloropicrin as warning agent and in 125, 150 and 450 pound cylinders of 100 per cent methyl bromide, it will be sold through distributors.

Denver Office for Meyer, I-Mountain

A Denver, Colo., office has been opened at 851 N. Broadway by Wilson & Geo. Meyer & Co. Intermountain. Established primarily to handle distribution, in mountain and plains states, of Western Phosphates, Inc., materials, it is in the charge of Jerome Brim.

Former plant manager for the National Fertilizer Co. div. of

National By-Products, Inc., and USDA soil scientist at McCook, Neb., he is president of the Colorado Soil Improvement Association.

Hercules Continues 4-H Award Program

At the opening of the 34th National 4-H Club Congress, the six national winners of \$300 college scholarships in the national 4-H entomology awards program were announced. It was the fourth year of competition in the program, sponsored by Hercules Powder Co.

The National winners and six other sectional winners received trips to the congress, county winners received gold-filled medals and state winners were awarded wrist watches.

Lilly Adds Indiana Research Center

Negotiations have been completed by Eli Lilly & Co. for purchase of a 267 acre farm to be used for agricultural research. Adjoining a 150 acre tract on which the firm's biological labs at Greenfield, Ind., are located, the combined sites will serve as a center for expanding Lilly agricultural research.

Addition of buildings and other facilities is expected to begin soon after the firm takes possession of the tract on March 1. Included will be greenhouses principally for research in plant disease, control and growth.

Dr. J. F. Downing heads Lilly agricultural research and his associates include Dr. Curt C. Leben in plant pathology and physiology research.

Agri-Serv, Calspray Sign NH₃ Agreement

Under a new marketing agreement between California Spray-Chemical Corp. and Agricultural Ammonia Service, Inc., Agri-Serv will be the sole authorized distributor of Ortho NH₃ throughout the San Joaquin Valley and the coastal counties of Los Angeles, Ventura and Santa Barbara. The announcement was made by Calspray's A. W. Mohr and Fred M. Steward of Agri-Serv, a pioneer firm in bulk handling of agricultural ammonia on the coast.

Storage, distribution and application facilities will be more than doubled by Agri-Serv, and it will greatly increase the present staff of consulting, servicing and application personnel.

Cal-Spray will place in the field a staff of field agronomists available for consultation work.

Sexauer Co. Now Dow Sales Agent

Sales of Dow agricultural chemicals will be handled by The Sexauer Co., Brookings, S. D., with operations in N. D., S. D., Minn., Iowa and Neb., according to a recent announcement.

In North Dakota, sales will be handled by the firm's New Day Seedsman Division.

Fert. Plant for Ohio Equity Exchange Co.

Ohio Equity Exchange Co., Lima, Ohio has announced that work began last month on construction of a fertilizer plant at Crestline, Ohio. According to Hubert B. Calvelage, treasurer, the factory will have storage capacity for 5,000 tons.

Designed by the D. M. Weatherly Co. it will include a 20 tons/hour Weatherly controlled-granulation unit. A separate building will house bagging and shipping units and will provide storage space for bagged goods.

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... comes naturally to Sturtevant engineers — with their 75-year tradition of successful solving of dry-processing problems. If you want to accomplish the most effective grouping of a Micronizer* Grinding Machine with necessary compressor, feeder and dust-collector, it will pay you to investigate. Check the coupon on the right for more information.

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Look at the record! 30 inch model reduced titanium dioxide to 1 micron and finer at solid feed rate of 2250 lbs. per hr. 24 inch model reduced DDT (50%) to 3.5 average microns — 1200-1400 lbs. per hr. 8 inch model reduced Procaine—Penicillin—to 5 to 20 microns—up to 20 lbs. per hr. Couldn't you use milling performances like these?

No moving parts. The particles grind each other. High-speed rotation and violent grinding impact of particles are caused by jets of compressed air or steam at angles to the periphery of the shallow grinding chamber. There are

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. . . Business & Management

Mixing Facilities for Dakota Fert. Co.

N. Andy Anderson, owner of the Dakota Fertilizer Co. at Canton, S. D. writes that he expects to be in the fertilizer mixing business for the spring season.

A building has been acquired along with ammoniating equipment, one ton mixer and other facilities. Anderson will service a trade area including portions of S. D., Iowa and Minn.

Continued Attack on La. Power Use Tax

Under attack in Louisiana is a power use tax, termed a deterrent to the location of new industries, especially fertilizer and chemical plants. A study by the state public affairs research council showed that Louisiana is the only state imposing such a tax and that its effect as a cost factor is particularly significant in industries requiring "unusually large amounts of electricity, such as chemical and synthetic fertilizer plants."

"Such plants are locating in

the Gulf Coast states," the report continues, "due in part to natural resources. These are among plants which Louisiana is anxious to attract."

The levy in question not only taxes sales of electricity by utility companies but also the power generated by an industry for its own use.

Past efforts for a repeal have been unsuccessful, but the issue may be brought up again during the 1956 session.

Pesticide Carryover Continues to Drop

Stocks of carryover pesticides dropped again in the year ended Sept. 30, 1955, 9 per cent below 1954 and 29 per cent less than in 1953. Formulations accounted for about 45 per cent of the 1955 stocks, compared to 37 per cent of the 1954 carryover.

The report, a preliminary one, was compiled by USDA in cooperation with NAC Association from figures provided by about 175 manufacturers. A more complete accounting is expected early this year.

Wide Aerosol Use Shown in Survey

A survey released by E. I. du Pont de Nemours & Co. shows that 91 of 100 families interviewed in a nation-wide study has purchased one or more home aids in push-button aerosol packages.

Insecticides maintained a big lead with 76 per cent of the 4,305 families polled reporting purchase of aerosols for control of flying insects. From 52 to 59 per cent had tried the three next most popular materials—room deodorants, hair sprays and insecticides for use against crawling insects.

Market Study by Garden Foundation

Garden Foundation, Inc., has issued the first of a series of market studies on distribution and sale of garden supplies. Dealing with the Cleveland, Ohio metropolitan area it followed a national review and a commodities report on the fertilizer market also compiled and issued by the Foundation.

Incorporations

Coastland Chemical Corp. (agricultural products), c/o John M. Keating, 41 E. 42nd St., NYC 17 with 200 shares of no par capital stock. Directors include Albert H. Brodtkin, John M. Keating and Samuel Rosenbloom, same address.

Young & Mazura Produce, Inc. (fertilizers, insecticides, etc.), Riverhead, N. Y., c/o Thomas J. Walker, with capital stock of \$20,000. Directors include Frank E. Mazura, Eastport, N. Y.; Henry M. Zaleski, Riverhead; and Thomas A. Mazura, Riverhead.

Pesticide Stocks — 1955

Materials	Percentage change from 1953		Percent of 1955 total reported as formulations
	1954	1955	
Benzene hexachloride, including lindane (gamma basis) ..	plus 11.0	minus 40.7	43.0
Calcium arsenate	minus 34.7	" 85.6	—
DDT	" 11.8	" 16.6	42.4
2,4-D (acid basis)	" 11.6	plus 13.9	47.2
Lead Arsenate	" 2.5	" 1.6	—
Sulfur	" 32.3	minus 38.1	59.3
2,4,5-T (acid basis)	" 16.6	" 32.4	52.4
Aldrin, chlordane, dieldrin, heptachlor, toxaphene ¹	" 39.8	" 48.9	39.0
Captan, chloro-IPC, DDD, dithiocarbamates, malathion, methoxychlor, parathion, sodium TCA ¹	" 7.9	plus 32.2	46.7
All above materials	" 22.2	minus 29.0	—
All materials reported	—	—	45.0

¹ Materials produced principally by less than three firms are treated in groups.

On Schedule

First Shipment Made December 15th urea-ammonia solutions... ammonium nitrate solutions... anhydrous ammonia

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. . . Business & Management

Chemical Sales Set Another New High

Another all time high in chemical industry sales was reached during 1955, according to Manufacturing Chemists' Assn., with an estimated \$23 billion representing a 17.6 per cent increase over 1954. Expansion also continued at a high level as total investment exceeded \$1 billion for the fifth consecutive year.

Other gains were noted, based on six-months government figures, in profits after taxes, dividends and production.

Orchards Baited by NY Air Operators

A recent Cornell FARM RESEARCH issue reports on use of airplanes in control of meadow mice in orchards. The spreading of zinc phosphide cracked corn bait

is providing some off-season activity for several custom applicators in New York and good results in control work.

Six to eight pounds of bait per acre are distributed by treating the orchards in blocks with one pass over each tree row just above tree-top height. Costs have ranged from \$1.50 to \$2.00 per acre and it is said a 200-acre unit can be baited in less than a day.

La. Creosote Plant to Olin Mathieson

Olin Mathieson Chemical Corp. has purchased the Shreveport plant of American Creosoting Co. Included were a two-cylinder creosoting plant and an ADZ mill for processing ties.

O-M will continue to produce Wolmanized treated lumber at its Bell Street plant.

Six H₂SO₄ Plants For Mexico in 1956

Mexico will have six new plants, producing a total of 160 metric tons daily of sulfuric acid, early this year. Located in the industrial zones of Monterrey and Tlal-nepantla, they will utilize sulfur from the saline domes of the Isthmus of Tehuantepec.

Firms initiating the production are Mexican with the exception of Monsanto Mexicana, S. A., local subsidiary of Monsanto Chemical Co. The latter plant will have a 50 tons per day capacity, highest of the six new units.

Enrique Uhthoff, general manager of the Monsanto firm, revealed that acid production has risen from 33,365 tons in 1947 to over 150,000 last year. The new production will more than cover 1955's deficit of 10,000 tons, and imports will cease. E. Z.

New Incorporations

Agricultural Products Corp. has moved its offices to the plant location, P. O. Box 183, Webster City, Iowa. The telephone number, 1171, remains the same.

Allied Chemical & Dye Corp. has consolidated the Cleveland sales office of its Barrett, General Chemical, National Aniline, Semet-Solvay and Solvay Process Divisions at 3121 Euclid Ave.

Hobaugh & Marvin, Agricultural Chemicals, Wichita, Kan., sales office is now in larger quarters at 3405 N. Broadway, a few doors south of the former location on US Route 81 at the north edge of the city.

Olin-Mathieson Chemical Corp., Washington, D. C., offices are now located at Room 603, Bank of Commerce Bldg., 1700 K St., N. W. The telephone number remains REpublic 7-3924.

FARM CHEMICALS

Eight 4-H Alumni Honored



Eight former 4-H members were honored on Nov. 30 at the National 4-H Club Congress in Chicago as winners of National 4-H Alumni Recognition Awards, which are provided by Olin Mathieson through the National Committee on Boys and Girls Club Work. Shown are Mrs. Richard Darden, W. D. Knox, Dr. R. B. Dickerson, Clyde H. Duncan, Dr. Ben F. Hilbun, S. L. Nevins and Dr. Paul D. Sanders. Not shown are R. B. Tootell and Mrs. C. Deitemeyer. The program is conducted by Cooperative Extension Service.

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Pulp Mill	✓	
Bleach Plant	✓	
Paper Mill	✓	
Multiple Bag Plants	✓	
Natural Kraft	✓	
Colored Kraft	✓	
Bleached Kraft	✓	
Creped Kraft	✓	
Wax Laminated Kraft	✓	
Asphalt Laminated Kraft	✓	
Wet-Strength Kraft	✓	
Water Repellent Kraft	✓	
Stak-LOK Super Rough Kraft	✓	
Valve Bags — sewn or pasted	✓	
Open Mouth Bags — sewn or pasted	✓	
Flat Sewn Valve Bags	✓	
Flat Sewn Open Mouth Bags	✓	
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Creped Tape	✓	
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. . . Business & Management

Plant Food Needs Studied in Mexico

Fertilization of Mexican soils is the subject of more and more official study. A recent Department of Agriculture report showed that Mexico produces only 70,000 tons of ammonium sulfate, enough for 240,000 of the total of nine million tillable hectares.

Department experts now have a goal of fertilizing at least two million hectares, requiring annual production of 500,000 tons of ammonium sulfate. To achieve this, an investment of at least 500 million pesos (\$40,000,000) will be required for installation of fertilizer plants.

With plant food demands steadily increasing, the Department of National Economy plans to grant import permits for at least 100,000 tons of nitrogenous compounds in 1956 for use by producers of wheat, corn, cotton and sugar cane. It is estimated Mexico will spend between 120-130 million pesos (\$9.6-\$10.4 million) for the imports.

The current administration feels that a domestic fertilizer industry would make possible agricultural production on 22 million hectares instead of less than half this amount now exploited. In addition, it is estimated that cost of the production units could be liquidated in five years through savings in decreased imports. E. Z.

Okla. Views Sales Tax Exemptions

An interim study will be conducted by the agriculture committee of the Oklahoma State Legislative Council to consider the question of whether fertilizer, pesticides, feed, seed and farm machinery should be exempted

from the state's two per cent sales tax.

Rep. A. R. Larason, Fargo, stated that he plans to submit a bill providing for exemption of feed on filing of an affidavit to show it was to be used for livestock and fertilizer, adding that a similar proposal could be made for fertilizer and seed with other provisions for insecticides. A proposal for the exemption was submitted to the committee by the Oklahoma Farm Bureau.

The grasshopper control program was endorsed by the committee which adopted a resolution to ask the legislature for appropriations to make the program permanent.

Farm Bank Reps at Spencer Meet

Spencer Chemicals' latest symposium for bank farm representatives was held in Kansas City, November 16-18, and included a day-long panel discussion at



Six bank farm representatives sample ammonium nitrate prills during 3-day seminar conducted by Spencer.

which the FR's discussed questions concerning their work.

Features of the meeting included a talk by Raymond J. Doll, agricultural economist for the Federal Reserve Bank of Kansas City on the present and future trends on the agricultural economy and a flight to Spencer's Jayhawk Works to tour the ammonium nitrate facilities.

Kentucky Issues Boron Regulations

Bulletins have been issued by the Department of Feed & Fertilizer, University of Kentucky, covering labeling of borated fertilizers and the manner in which appreciable fertilizer deficiencies will be handled in 1956.

The regulations on labeling of fertilizers containing boron, include these points:

Deficiencies said the Kentucky release, will be calculated on an individual basis according to these principles:

Brand name should include "boron" or name of boron carrier. "With borax", "with boron", "borax added" or similar expression is suitable and should be printed in same size type and appear as prominently in labeling as the numerals.

It is suggested that the equivalent amount of borax per 100 lbs. be included in the label. The guaranteed analysis, besides N, P₂O₅ and K₂O must include percentage of boron as the element.

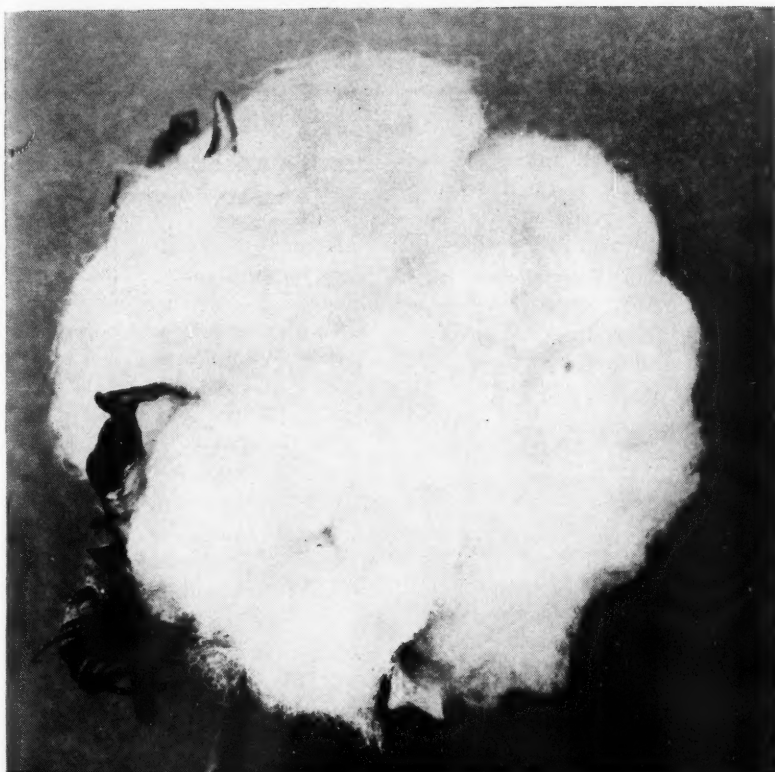
If boron is added by dilution of standard fertilizer grades, the label must carry a statement of guaranteed analysis after dilution, with no reference to grade used in dilution. Custom mixing of a standard grade with borax by dilution, without registering and labeling the final product is permitted only when the buyer or agent has made a bona-fide purchase and has been given actual possession of the registered and labeled products before mixing.

A fertilizer will be considered seriously deficient if below guarantee by over $\frac{1}{2}$ unit (0.5%) in N, $\frac{3}{4}$ unit in P₂O₅ or $1\frac{1}{2}$ unit in K₂O. An overage in one element will not effect a deficiency in another when the deficiency in any one nutrient is as indicated.

Combinations of deficiencies will be considered if the combined unit value amounts to more than 1.50 calculated on a 3-2-1 basis.

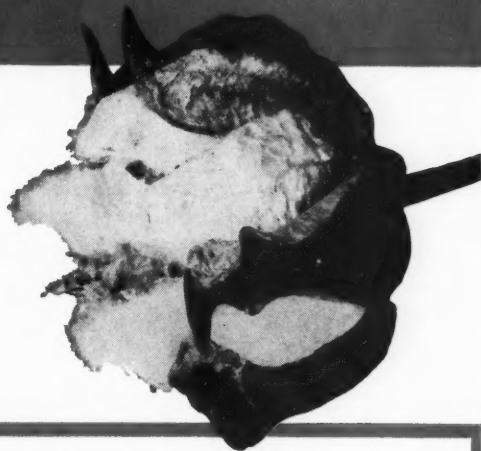
An overage in one nutrient will be allowed to offset deficiency in another, if all deficiencies are less than amounts listed in the initial paragraph.

FARM CHEMICALS



with sufficient potash

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without sufficient potash

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Southern Sales Office

Rhodes-Haverty Building, Atlanta, Georgia

... Business & Management

Ozark-Mahoning Co. Plans Tulsa P Unit

A new Southwest fertilizer plant will be built at Tulsa, Okla., at a cost of one million dollars by Ozark-Mahoning Co. Adjoining existing company plants at West Tulsa, the ammonium phosphate facilities will have a capacity of about 50,000 annual tons of high analysis, water soluble complex fertilizers.

One basic ingredient, sulfuric acid, has been produced by the firm in Tulsa for over 30 years, and a phosphoric acid plant is now being designed by Singmaster & Breyer. According to O-M President C. O. Anderson, design of the fertilizer plant and construction will be handled by the company's own forces.

A submerged combustion evaporator will be one of the more unusual aspects of the new plant. Used successfully for many years at the O-M plant in Monahans, Tex., it is an underwater gas burner in which the flame actually impinges on the solution and operates submerged in the acid. Made of graphite, it is termed an excellent means of concentrating the phosphoric acid prior to treatment in the fertilizer plant.

Installation of scrubbing devices is expected to eliminate any dust for fume problems.

Ozark-Mahoning expects to set up its own sales organization, marketing its product under its own trade name through the middle and south west. C. T. Longaker has joined the firm as director of sales for the new fertilizer department.

L. H. Wilson Named ARC Vice-President

Louis H. Wilson, secretary and director of information for the National Plant Food Institute, has been named vice-president of

the Agricultural Relations Council, an organization for those engaged in public relations work in agriculture and allied industries.

One of the six directors of the council is Wallace S. Moreland, Rutgers University, NAC Association consultant.

Hats off to—



James M. Quinn, California Sun Fertilizer Co., Los Angeles. Presented with a plaque at the 32nd annual convention of the California Fertilizer Association in recognition of outstanding service to CFA and the industry over a period of many years. An important contribution was major reorganization of finances and the program of work of CFA in 1950 and 1951.

New in Advertising

Larvacide Products, Inc. The account is now handled by Metropolitan Advertising Co., NYC.

Stauffer Chemical Co., industrial and agricultural chemicals to John Mather Lupton, Inc., NYC, for advertising and public relations.

Downing Industrial Advertising, Inc. is the new name of Walker & Downing Industrial Advertising, Pittsburgh. Address and personnel remain the same.

Garden Research Lab Merger Deal

Merger of Nutritional Concentrates, Inc. with Garden Research Laboratories has been approved by stockholders of both concerns. The new concern retains the latter name with executive offices in New York City.

A packaged products division will be set up to serve the "do-it-yourself" market and another will handle equipment and automatic services sales to home owners. A third will handle farm sales.

New chairman of the board is J. R. Pursell, director and executive vice-president of the Brookline Trust Co., Pittsburgh, and the president is C. H. Snyder, also head of Sunnyhill Coal Co., New Lexington, Ohio.

1955 US Statistical Abstract Printed

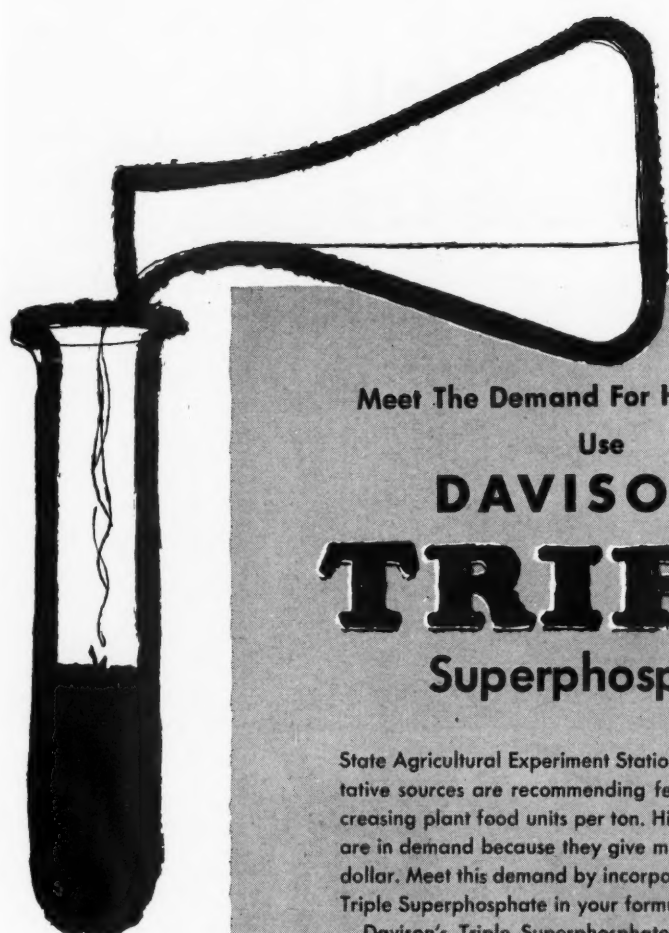
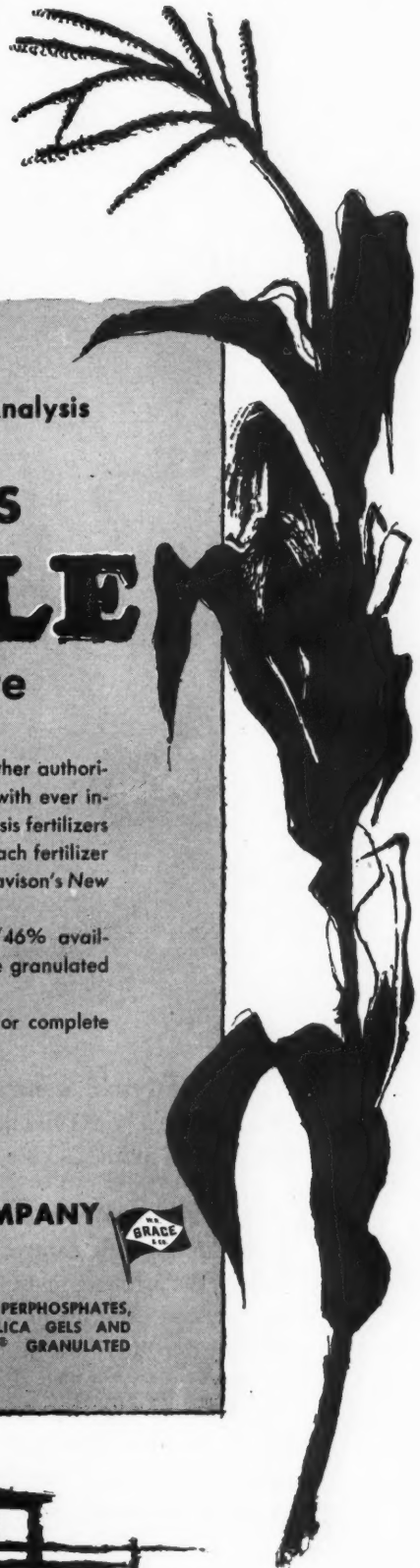
Availability of the *1955 Statistical Abstract of the United States* has been announced. Copies can be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., or any U. S. Dept. of Commerce field service office at \$3.50 a copy.

DuPont Increases Education Grants

DuPont Co. has announced a fund of over \$900,000 for grants to more than 100 universities and colleges. The support represents an increase of about \$100,000 over the 1955 program.

All the increase and nearly half the program are for improvement of teaching in colleges and universities and in high schools. Grants will support science, mathematics and other subjects.

FARM CHEMICALS



Meet The Demand For High Analysis

Use

DAVISON'S
TRIPLE
Superphosphate

State Agricultural Experiment Stations and other authoritative sources are recommending fertilizers with ever increasing plant food units per ton. High analysis fertilizers are in demand because they give more for each fertilizer dollar. Meet this demand by incorporating Davison's New Triple Superphosphate in your formulation.

Davison's Triple Superphosphate has 45/46% available P_2O_5 and is supplied in the easy-to-use granulated form or run-of-pile.

Order Davison's Triple Superphosphate. For complete information, call or write.

Progress Through  Chemistry

DAVISON CHEMICAL COMPANY

Division of W. R. Grace & Co.

Baltimore 3, Maryland

PRODUCERS OF: CATALYSTS, INORGANIC ACIDS, SUPERPHOSPHATES, TRIPLE SUPERPHOSPHATES, PHOSPHATE ROCK, SILICA GELS AND SILICOFLOURIDES. SOLE PRODUCERS OF DAVCO® GRANULATED FERTILIZERS.



**Again we tell
3½ million farmers**

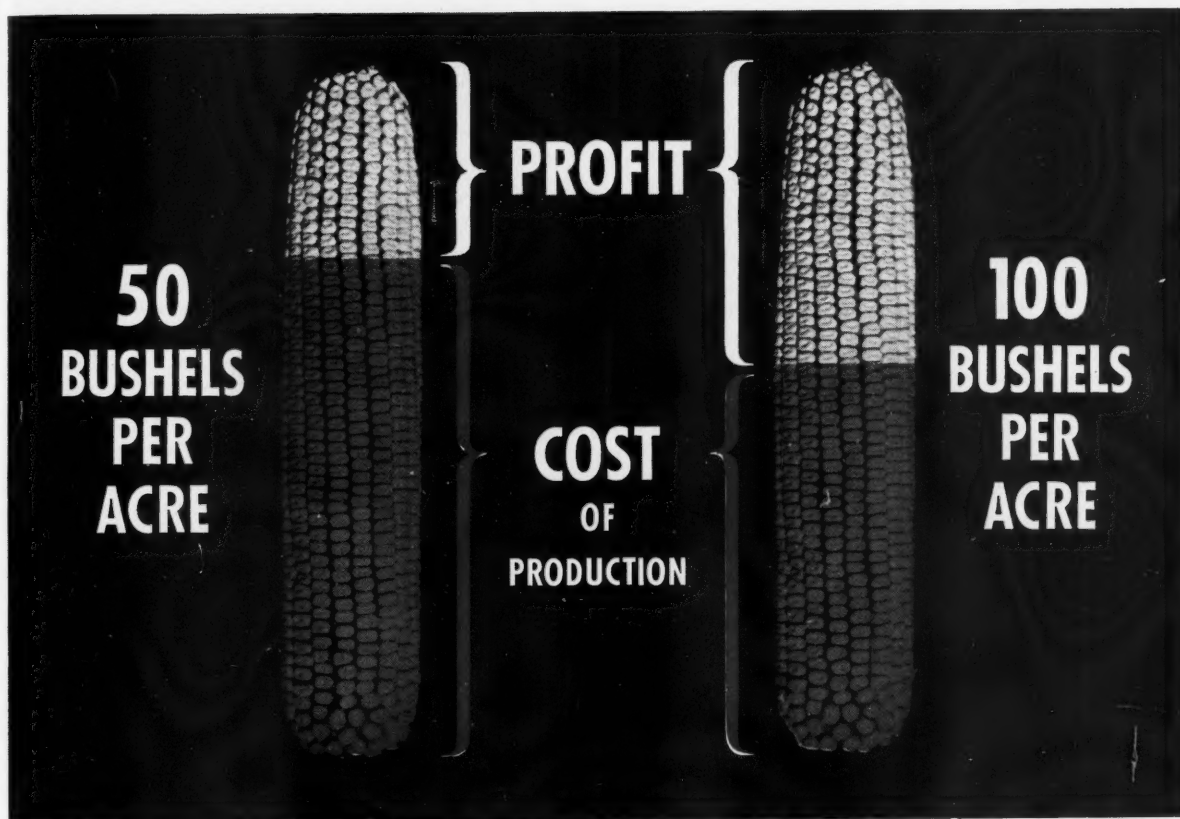
Fertilizer Grows Farm Profits

The advertisement on the opposite page is the second in a series in a powerful and continuing campaign directed to the attention of more than 3½ MILLION readers of farm magazines.

Nitrogen Division, Allied Chemical & Dye Corporation, is conducting this campaign to serve the best interests of the farmer, the fertilizer manufacturer, the county agent, the country banker, the experiment station, the extension service and all others interested in a profitable agriculture.

This campaign is designed to be helpful to you in your efforts to serve the farmer. We trust that it meets with your approval and we greatly appreciate any comments or suggestions you may wish to send us.





MORE FERTILIZER MEANS MORE PROFIT PER EAR

More fertilizer per acre means more bushels per acre added to your yield at very low extra cost. This reduces your cost of production per ear or per bushel and increases your net profit.

For example the corn ears pictured above show how fertilizer worked for some typical corn growers on good land. Fixed expenses, such as land-use, management, labor and machinery were the same whether the yield was 50 bushels or 100 bushels per acre.

To increase the yield to 100 bushels the only extra investment required was **MORE FERTILIZER** per acre, more seed for closer spacing and extra labor for harvesting the larger yield. Fifty extra bushels per acre were added to the yield at very low extra cost and far greater profit per bushel.

More fertilizer per acre is your best-paying investment. Results vary on

different crops and soils but the basic economic fact prevails: a bushel or a pound of any crop can be produced much more economically when the yield is high than when the yield is low. More fertilizer is the direct route to high yields.

The price of fertilizer has not gone up like the prices of many other things the farmer buys. Returns from thousands of tests show that \$1 invested in fertilizer produces an average return of \$3.75 in extra yields. On many crops the return is much higher.

Fertilizer is your best investment. Fertilizer reduces your cost of production per bushel and increases your net profit. Use more fertilizer this year!

The fertilizer industry serves the farmer. Nitrogen Division serves the fertilizer industry as America's leading supplier of nitrogen for use in mixed fertilizers.

See Your County Agent

Ask your County Agent to recommend the analyses and the amounts of fertilizers best suited to produce big yields of the crops you grow on your soil. His advice to you is based on the latest official recommendations from your Extension Service and Experiment Station.



See Your Banker



Bankers are alert to good investments. They know that fertilizer pays a big return in the short period of a growing season. If you need money to buy more fertilizer, most bankers consider the extra yields produced by fertilizer as an excellent risk.

See Your Dealer



Your fertilizer dealer can supply you with a good brand of fertilizer in the amounts and analyses as recommended by your County Agent. Help your dealer to get your fertilizer to you on time by placing your order early and accepting prompt delivery. Use more fertilizer than ever before and have it on hand when you need it. Remember, fertilizer grows farm profits. Use enough to really pay you big!



NITROGEN DIVISION Allied Chemical & Dye Corporation
New York 6, N. Y. • Hopewell, Va. • Ironton, Ohio
Omaha 7, Neb. • Indianapolis 28, Ind. • Columbia 1, S. C.
Atlanta 3, Ga. • Kalamazoo, Mich. • Columbia, Mo.

Fertilizer Grows Farm Profits

Book Department

Chemistry of the Soil, edited by F. E. Bear. ACS Monograph No. 126. \$8.75

A complete interpretation of chemical processes involved in soil development written by 14 outstanding scientists. Fully covered are chemical composition of soils, nature of soil colloids, organic matter relationships, oxidation-reduction phenomena, problems of acid, alkaline and saline soils and plant nutrition. A special chapter is included on trace element chemistry and the intimate relationships between plant roots and the soils in which they grow.

Applied Entomology, 5th Ed. Fernald & Shepard. \$7.00

New revision deals not only with insect control but also provides an introduction to insect classification and other phases of general entomology. Chapters on insecticides have been completely revised, new information is included on biology and distribution of particular insects and insect physiology is given increased emphasis.

Soil Fertility, C. E. Millar. \$6.75

Treats all aspects of soil fertility with emphasis on the plant itself. Has full information on all major plant foods and the important trace elements. Problems of saline and southern soils are considered at length and regional cropping systems are discussed.

Phosphoric acid, Phosphates and Phosphatic Fertilizers, 2nd Edition. ACS Monograph No. 34. \$15.00

Written in direct, readable style, by W. H. Waggaman and 17 outstanding authorities, the book is a leading source of information on all phases of the chemistry, technology and uses of phosphorus. Of value to those engaged in production and processing of phosphate rock and to plant superintendents and executives of industries in which phosphorus is of importance. Covers sources of rock, processing, production of phosphorus compounds.

Commercial Fertilizers, 5th edition. G. H. Collings. \$8.00

Completely revised with new material and many modifications covering the recent important advances in production and use of fertilizers.

Manual on Fertilizer Manufacture, 2nd edition. Dr. V. Sauchelli. \$4.50

Prepared especially for those engaged in fertilizer production, completely rewritten with new data on mixed fertilizers, granulation and ammoniation.

The Care & Feeding of Garden Plants. \$3.00

A new book by 14 authorities designed to acquaint home gardeners with plant food deficiencies. Color plates aid in identification of deficiency symptoms.

clip here and mail with remittance

Reader Service Dept., Farm Chemicals
317 N. Broad St., Philadelphia 7, Pa.

Please send me the following books postpaid:

Copies

.....Chemistry of the Soil @ \$8.75

.....Applied Entomology @ \$7.00

.....Soil Fertility @ \$6.75

.....The Care & Feeding of Garden
Plants @ \$3.00

I enclose (check) (money order) for \$

Name

St. Address

CityZoneState

No
C. O. D.
Orders

.....Phosphoric Acid, Phosphates
& Phos. Fertilizers @ \$15.00

.....Commercial Fertilizers @ \$8.00

.....Manual on Fertilizer Manu-
facture @ \$4.50

PEOPLE

American Chemical Paint Co. Vice President John O. J.



Shellenberger

Shellenberger has been named director of marketing to supervise sales and marketing activities of the firm's three main divisions—Agricultural Chemicals, Metalworking Chemicals and the International Division. Shellenberger joined ACP in 1935 as advertising manager.

American Cyanamid Co.'s security director, Edward E. Conroy, is a member of the Department of Defense industry advisory committee on safeguarding classified information. Conroy will head the program for chemical and industrial medical fields.

American Potash & Chemical Corp. Willard P. Scott, a director since 1951, has been appointed an AP&C vice president. He will remain a partner of Oliver & Donnelly, general counsel for the firm.



Scott

Appointment of Forrest Branch to the new position of director of administrative services, John A. Nevards to insurance supervisor and retirement of Russell W. Mumford, vice president and consulting engineer, also were announced.

Atlas Powder Co. Two directors, Charles Warner and Cecil F. Backus, have (to page 18)

FARM CHEMICALS



**All crops need nitrogen.
When they do . . .**

SELL HORSE & LION NITROGEN FERTILIZERS

ALL HORSE & LION nitrogen fertilizers are easy to spread—because they're granulated for that particular purpose. So they are easy to handle, and easy to apply. If you want to sell the **best**, at competitive price, offer "**Horse & Lion**" nitrogen fertilizers—five different types and concentrations for various requirements:

HORSE & LION Calcium Nitrate: 15½% pure nitrogen, combined with about 28% available lime. Granulated.

HORSE & LION Calcium Ammonium Nitrate: 20½% pure nitrogen (10¼% nitric and 10¼% ammoniac nitrogen) and approximately 33% calcium carbonate. Granulated.

HORSE & LION Ammonium Sulphate Nitrate: 26% pure nitrogen (11% nitric and 15% ammoniac nitrogen, Granulated.

HORSE & LION Urea 44: 44% pure nitrogen. Coated pellets for dry use.

HORSE & LION Urea 46: 46% pure nitrogen. Pellets without coating for liquid application or dry use where fast dissolving desired.



For complete information and prices, contact your nearest "HORSE & LION" fertilizer headquarters.

ATKINS, KROLL & Co.

Established 1906

EXCLUSIVE DISTRIBUTORS, U. S. A.

500 Fifth Avenue, New York 36, New York

417 Montgomery Street, San Francisco 4, California

417 South Hill Street, Los Angeles 13, California

421 S.W. Sixth Avenue, Portland 4, Oregon

... People

(from page 16) retired from the board, and one new director, Wilfred D. Gillen, recently was elected.

New assistant general manager of the Chemicals Division is Edward J. Massaglia, former vice president and director of Pfizer International, Inc.

California Spray-Chemical Corp. Three district managers appointed: Cecil M. Crutchfield for the Mississippi Delta area, Earl Lanier Stripling, Jr., Southeast, and James P. Toffaleti, South Central District.



Crutchfield

Florida and Tennessee.

From his Goldsboro, N. C. office, Stripling will supervise Georgia, South Carolina and part of North Carolina operations. Prior to joining Cal-spray six years ago, he was a branch manager for Florida, Cuba and Puerto Rico.



Stripling

Formerly Mississippi Delta area district manager, Toffaleti will make his headquarters in Shreveport, responsible for Louisiana, Oklahoma, parts



Toffaleti

of Texas, Arkansas and New Mexico.

A gold watch and 30 year service pin was presented to Phil S. Williams, vice president and chief engineer during the recent district manager's meeting at the Diablo Country Club in Diablo, Calif.

Diamond Alkali Co. Walter R. Roberts, for 20 years manager of silicate sales, retired Dec. 31. Succeeding him is Clifford S. Hancock, manager of calcium carbonate sales, who will also continue in this capacity. Diamond silicate chemicals will be handled by C. W. Turner, manager of detergent specialty sales.

Also retiring on Dec. 31 is Harold U. Daniels, secretary and company counsel, who will return to law practice in Mentor.

Diamond Black Leaf Co. Appointment of Wayne D. Wegrich as Des Moines pesticide plant manager was recently announced.

Built and put into operation in January 1955 by Geigy Agricultural Chemicals, the plant was taken over on Dec. 1 by DBL. Prior to this assignment, Wegrich served as manager of the firm's Waco, Tex., plant.

DBL also has named George B. Williams sales and service representative, to cover Ohio.

DuPont Co. Henry C. Anderson has joined the garden chemicals sales force, assigned to the southern half of the Chicago metropolitan area, and parts of Illinois and Indiana.

Escambia Bay Chemical Corp. Dr. Nat C. Robertson



Robertson

has been named a director of research. A native of Atlanta, he will make his headquarters temporarily with the National Research Corp.

at Cambridge, Mass., where for several years he has been director of its Petrochemical Dept.

Daniel Fitzpatrick, Sr., 84; retired owner of Jersey City Fertilizer Co., died on Nov. 18 in South Orange, N. J.

Food Machinery & Chemical Corp. Dr. Emil Ott, former director of research for Hercules Powder Co., has been appointed director of central chemical research and a vice president of FMC's Chemical Div.



Ott

At present Dr. Ott will locate in New York City, pending completion of a multimillion dollar research center for the Chemical Div. near Princeton, N. J.

General Chemical Div., Allied Chem. & Dye Corp. Chester M. Brown has been named division president. M. M. Bid-dison, head of the division since 1951, will continue with the firm, functioning in an advisory capacity and handling special assignments. Brown joined General Chemical Div. in 1929 as a production trainee and has since held posts as works superintendent, director of sales, vice president and executive vice president.

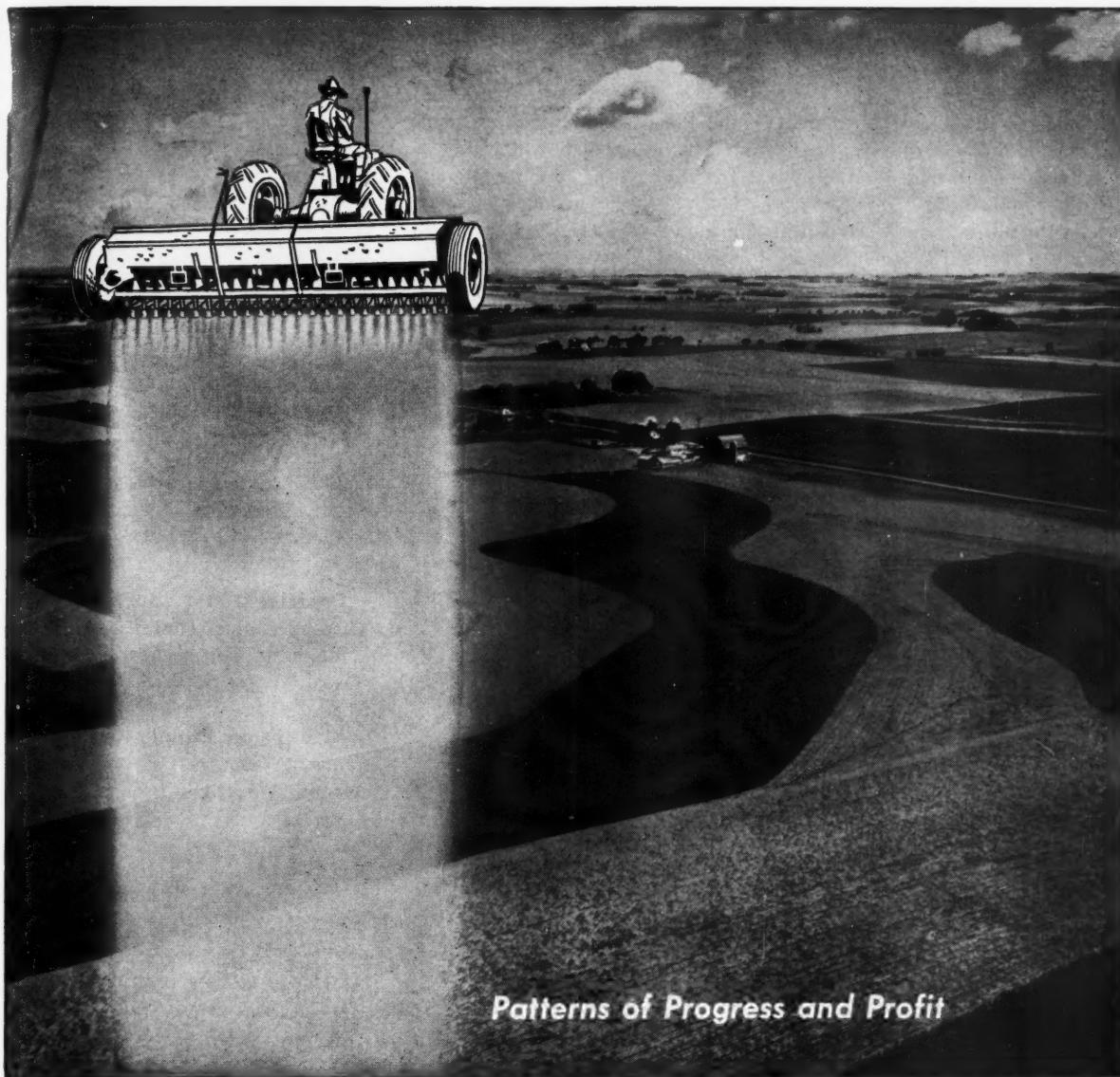
W. R. Grace & Co. Dewey and Almy Div. president Hugh S.

Ferguson has been named exec. vice pres. in charge of the parent company's chemical group.

Six other officers were promoted and Alexander T. Daignault was elected an executive (to page 20)



Ferguson



Patterns of Progress and Profit

(Photo — Courtesy Soil Conservation Service, U. S. D. A.)

High Grade Muriate of Potash

by

DUVAL

Duval Muriate of Potash
ranks high as one of the essential
nutrients which greatly increase yield
and profits in crop production.

DUVAL SULPHUR and POTASH CO.

Modern Plant and Refinery at Carlsbad, New Mexico

Address all communications to:
ASHCRAFT-WILKINSON CO.

Exclusive Distributors

ATLANTA, GEORGIA
Cable Address: Ashcraft

NORFOLK, VA. • CHARLESTON, S. C. • TAMPA, FLA. • JACKSON, MISS. • COLUMBUS, OHIO • DES MOINES, IOWA

... People

(from page 18) vice president and chief financial officer.

Exec. vice president Allen S. Rupley and Andrew B. Shea both take broad corporate responsibilities; James H. Stebbins succeeds Shea as exec. vice president in charge of South and Central American operations with John T. Whitely as deputy; Lucas A. Alden replaces Stebbins; Fred R. Feuss succeeds Alden as controller.

Hercules Powder Co. Dr. Robert W. Cairns, assistant director of the Research Dept., succeeds Dr. Emil Ott as director of research. Cairns joined the firm as a research chemist in 1934, and when its research planning committee was organized two years ago, he was chosen to be chairman of the group.

McCarty Co. Newly appointed director of the Chicago Agriculture Dept. is Albert M. Wolf. As a farm management counselor, he has been consultant to many dairy cattle breeders and to feed, fertilizer and other firms.



Wolf

Miller Chemical & Fertilizer Corp. Newly named entomologist and sales representative is Robert C. Berry. Prior to joining Miller, Berry was manager of the Agricultural Chemicals Dept. of Swedesboro Supply Co.



Berry

Monsanto Chemical Co. ap-

pointments: Philip A. Singleton of London, England, as assistant to the president and secretary of the executive and finance committee, succeeding J. P. Ekberg, Jr. who returned to the Organic Chem. Div. as manager of intermediate sales; H. S. Parham to assistant director of sales for planning, Organic Chem. Div.; Dr. Peter Arvan to assistant director of research, Inorganic Chem. Div.; Edmund Greene to assistant director, Advertising Dept.; Wilbur H. Grosse to advertising manager, Organic Chem. Div.; H. Chandler Holmes succeeds Grosse as corporate advertising manager.

Nitrogen Div., Allied Chem. & Dye Corp. Six agricultural sales promotions: George A. Kalteissen, Jr., eastern, and Garvin C. Matthieson, Midwest sales supervisor for direct application materials; Thomas E. Freese, supervisor for Procadian Urea Feed Mixture; Ernest M. Harper, supervisor for direct application solutions; Emerson M. Jones, Jr., Midwest sales supervisor for fertilizer manufacture materials and Earl K. McNew, supervisor for direct application materials. Adrian E. Butler recently joined N Div. as assistant to the manager of fertilizer manufacture materials.

Oklahoma A & M College. Dr. Marlow D. Thorne, recently with the Agricultural Research Service, USDA, has been appointed head of the Agronomy Dept.

Olin Mathieson Chemical Corp. Former assistant professor of soils at the University of Wyoming, Dr. J. Lynn Mellor, has joined the agronomy staff of the Western Fertilizer Div. With headquarters at Phoenix, Ariz., he will be concerned with research, development and promotion of farm chemicals and portable sprinkler irrigation systems.

Thomas B. Hooks, Jr. of Houston has been named manager of sales training for the West-



Mellor



Hooks

ern Fertilizer District. Hooks joined the company in 1950 and has been a sales supervisor in the Southwestern district office. He will locate in Little Rock.

Pacific Coast Borax Co. Three personnel changes: F. T. Winters, Jr. has been appointed special advisor on herbicide sales to Borax Consolidated Ltd., London, the parent firm; L. M. Stahler named manager of the Agricultural Sales Div.; and Dale Rake succeeds Stahler as director of agricultural research and development.

Pennsylvania Salt Mfg. Co. Lee H. Clark, manager of Sharples Chemical Div., was named vice president of the parent company, effective Dec. 1. Promotion of Benjamin Stonoga, B-K Dept. sales representative, to sales supervisor of the southwest territory, also was announced.

Southern Nitrogen Co. Election of six new directors and a



Brown

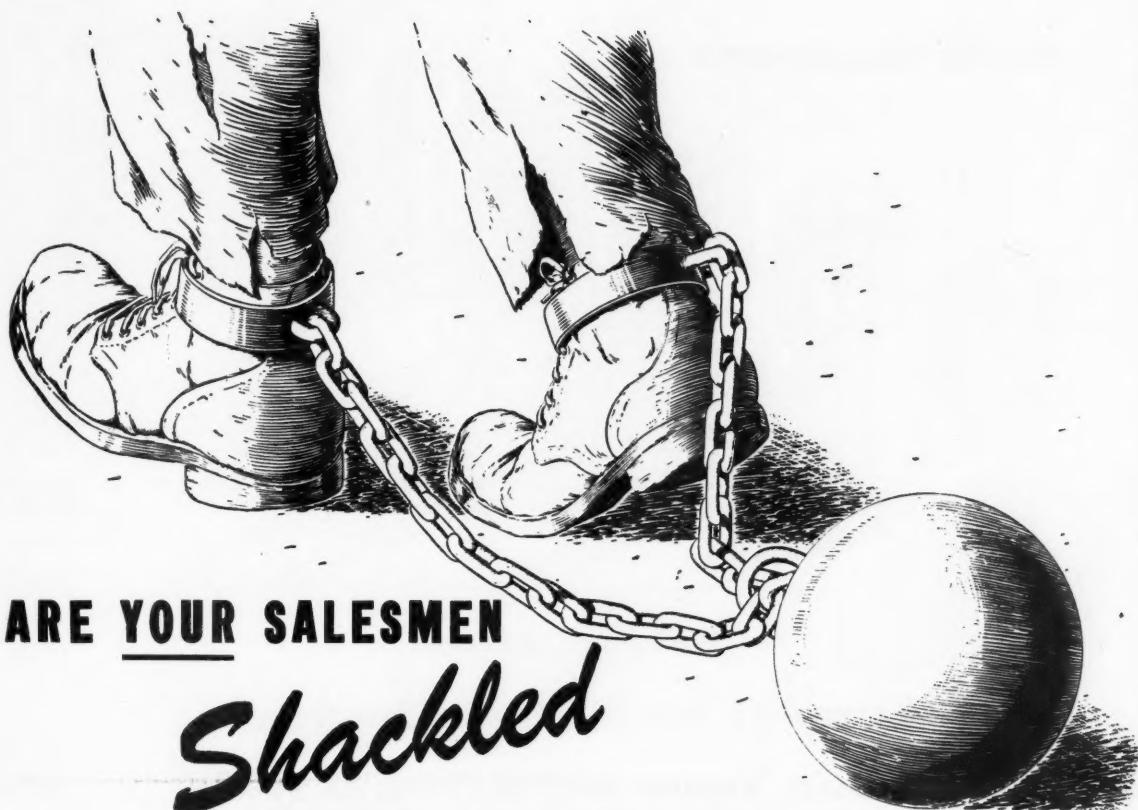


Woodward

treasurer and assistant secretary has been announced.

In addition to John R. Riley,

FARM CHEMICALS



ARE YOUR SALESMEN *Shackled* BY INADEQUATE NITROGEN?

BREAK THEIR CHAINS... give them a modern product to sell... a fertilizer containing UREA-FORM, the great new 38% Nitrogen that feeds evenly and safely all season long... ideal for mixes!

UREA-FORM is the amazing new non-leaching, non-burning, long-feeding Nitrogen developed through 15 years of USDA research—now available to you for the first time.

Put UREA-FORM in your products. Unshackle your sales department from the chains of inadequate nitrogen and watch them make money for you!

- ★ UREA-FORM FEEDS LONGER... 24 weeks or more... one feeding lasts an entire growing season.
- ★ UREA-FORM FEEDS EVENLY... no soft extravagant growth... promotes steady, healthy development.
- ★ UREA-FORM FEEDS SAFELY... won't burn even in high temperatures and bright sunlight areas.
- ★ UREA-FORM WON'T LEACH... stays put, won't wash away, won't make harmful salts either.
- ★ UREA-FORM IS ECONOMICAL... saves up to 6 times the labor, storage space and handling you now need!

MANUFACTURED BY:
NITRO-FORM AGRICULTURAL CHEMICALS
Division of Woonsocket Color & Chemical Co.
WOONSOCKET, R. I.



SOLE SELLING AGENT:
H. J. BAKER & BRO.
600 FIFTH AVENUE
NEW YORK 20, N. Y.

YOU Increase



When Lion

**- A Leader in Petro-Chemicals -
Supplies Your NITROGEN NEEDS**

**HERE'S THE LION LINE-UP
OF QUALITY NITROGEN
FERTILIZER MATERIALS**

Lion Anhydrous Ammonia—82.2% nitrogen. Quality guaranteed.

Lion Aqua Ammonia—Ammonia content about 30%—other grades to suit your requirements.

Lion Ammonium Nitrate Fertilizer—Improved spherical pellets. Guaranteed 33.5% nitrogen.

Lion Nitrogen Fertilizer Solutions—Various types to suit your particular manufacturing needs.

Lion Sulphate of Ammonia—White, uniform, free flowing crystals. Guaranteed 21% nitrogen.

Now that the new fertilizer manufacturing season is in full swing, make sure you realize all the profits your plant can produce. *Where you buy your raw materials can be vital and now, more than ever before, it pays to buy your nitrogen needs from Lion—a leader!*

Lion nitrogen products are manufactured under rigid controls to meet exacting specifications—ending the costly production delays that result when ingredients vary in quality from day to day. With Lion products, you produce with maximum efficiency and profit—and you maintain the quality standards your customers demand.

Lion also provides an expert technical staff to assist you in solving difficult formulation and processing problems. And, throughout the year, Lion's sales building advertising tells farmers the plant food story—for your benefit. Lion's leadership in customer service stands out, offering you outstanding opportunities for increased profits—and your best season yet!

DISTRICT SALES OFFICES: NATIONAL BANK OF COMMERCE BUILDING, New Orleans, La. • SHEPHERD BUILDING, Montgomery, Ala.

LION OIL

A DIVISION OF MONSANTO
CHEMICAL COMPANY



COMPANY

EL DORADO, ARKANSAS



In the corn belt!

The expanding use of

aldrin

for soil insects gives you

big profit opportunity

SALES of aldrin for soil insect control reached a new high for 1955! '56 promises to be an even greater sales year for this powerful soil pest control. You can cash in on this trend by recommending and selling insecticides and fertilizers containing powerful aldrin.

Once farmers apply aldrin, it goes to work quickly. Aldrin controls rootworms, wireworms, seed corn maggots, cutworms, ants, and other major soil insects. In fact, when these pests even touch, taste, or smell aldrin, they're finished for good. You can tell your customers that aldrin is easy and economical to use in a spray, dust, as granules, or mixed with starter fertilizer. Mere ounces per acre gives your customers dependable control.

Make 1956 a bumper profit year. Stock, sell, display formulations containing aldrin for soil insect control. Your customers will thank you for this advice—you'll build bigger profits.

aldrin



SHELL CHEMICAL CORPORATION

Agricultural Chemicals Division, 460 Park Avenue, New York 22, New York

president, Malcolm Smith, board chairman, and George V. Taylor, vice president, the board now consists of Richard F. Brown, newly elected vice president in charge of operations; Franz Schneider; Donald Stuart Russell, Richard H. Samuels, James A. Lyles and W. W. Foshay.

Newly elected treasurer and assistant secretary, M. G. Woodward, will also serve as controller. He had been exec. assistant to W. Levin, financial consultant.

Southwest Potash Corp. James J. Devlin, with SW Potash since 1952, has been named sales manager.

Spencer Chemical Co. John C. Denton succeeds R. F. Brown as general works manager. The former general manager of engineering and construction joined Spencer in 1942.

Byron Kern, chief engineer, has been promoted to general manager of engineering and construction. He is replaced as chief engineer by Robert Byorum.

Velsicol Chemical Corp.

Newly appointed assistant manager of the Memphis plant is F. E. Richardson. Previous to his new assignment, he was chief engineer at the Memphis plant. As a result of further expansion of Velsicol's sales and merchandising program James D. Merrill has been appointed to the firm's advertising staff. He will assist in planning and carrying out publicity, advertising and sales promotion program.



Richardson



Merrill

He will assist in planning and carrying out publicity, advertising and sales promotion program.

CONSTRUCTION

USI to Add Tuscola Phosph. Acid Unit

Phosphoric acid will be produced by U. S. Industrial Chemicals Co. in a new plant at Tuscola, Ill. Utilizing a S. A. Metallurgique de Prayton (Belgium) process it will have a capacity of 60,000 tons per year of 75 per cent wet process phosphoric acid produced from sulfuric acid and phosphate rock.

Engineer-constructor for the plant, which is expected to begin operation before the end of 1956, is Singmaster and Breyer.

Ontario Fert. Plant For Ag. Chem. Ltd.

Plans have been announced by Agricultural Chemicals Ltd. for construction of a new fertilizer plant at Hyde Park (London), Ont. The facilities are expected to be in operation by July or August of this year.

Spencer Plans New Research Center

A new chemical research center for Spencer Chemical Co. will soon be erected southwest of Kansas City in Johnson County, Kan. Scheduled for completion by Spring, 1957, it will be devoted

to research and development of new and improved products.

The center will initially house 100 to 125 people under Dr. John R. Brown, Jr., director of research and development and, in five to 10 years, it is anticipated that personnel may total 200.

Initial facilities will include a main chemical research lab building, process development pilot plant and later a greenhouse, with parking lots, roads and utilities.

Pennsalt to Make Aerosol Propellant

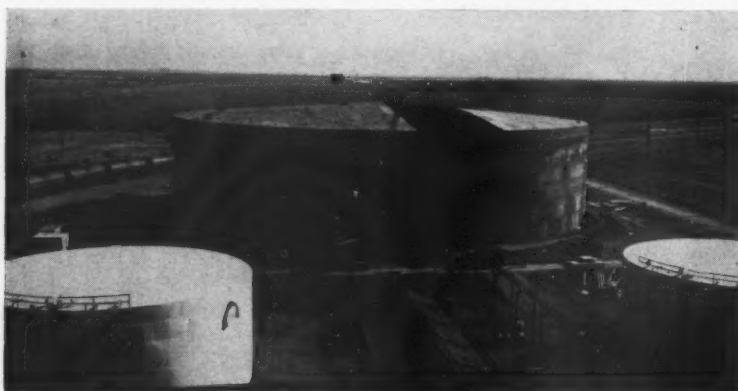
Late this year, Pennsylvania Salt Mfg. Co. will enter the aerosol propellant and refrigerant fields with the Isotron line of chlorofluorohydrocarbons produced in a new plant already under construction at Calvert City, Ky.

Giant Storage Unit For Phillips Plant

Last month Phillips Chemical Co. completed a 323,000 barrel aqua ammonia storage plant on a site adjacent to its Cactus plant near Etter, Tex. It is termed the largest atmospheric pressure tank ever constructed for storage of this material.

By increasing Phillips above and underground storage facilities for ammonia and aqua ammonia to almost one million barrels, it is expected to aid in maintaining plant production and order handling on even schedules.

Covering nearly an acre of ground adjacent to Phillips Cactus plant, the 323,000 barrel aqua ammonia storage unit nears completion.



FARM CHEMICALS

Calendar

Jan. 4-6. Weed Society of America charter meeting, Hotel New Yorker, New York City.

Jan. 5-6. Mississippi Insect Control Conf., Miss. State College.

Jan. 10-11. North Carolina Pesticide School, Raleigh.

Jan. 11-12. Wisc. Insect Control Conf. with Industry, Lorraine Hotel, Madison.

Jan. 16-18. N. W. Vegetable Insect Control conference, Imperial Hotel, Portland, Ore.

Jan. 16-18. Southern Weed conf., 9th annual meeting, Hotel Jung, New Orleans, La.

Jan. 17. Ga. Plant Food Educ. Soc., joint meeting with Ga. Section of ASA, University of Ga.

Jan. 18-20. Western Coop. Spray Project, Imperial Hotel, Portland, Ore.

Jan. 24-26. Midwestern Garden Supply Trade Show, International Exposition hall, Chicago.

Jan. 26-27. Custom Spray Operators Training School, Univ. of Ill., Ill. Union Ballroom, Urbana.

Jan. 26-29. Agric'l Aircraft Assn., 6th annual convention, Wilton Hotel, Long Beach, Calif.

Jan. 27. Colo. Agr. Chemicals Assn., Cosmopolitan Hotel, Denver, Colo.

Jan. 30-Feb. 3. 20th annual Purdue Pest Control Operators conf., Purdue Univ., Lafayette, Ind.

Feb. 6. Tennessee Seedmen's Assn., Andrew Jackson Hotel, Nashville.

Feb. 6-8. Agronomy Section, Assn. of Southern Agr. Workers, Biltmore Hotel, Atlanta, Ga.

Feb. 6-8. Cotton States Branch, ESA, annual meeting, Biltmore Hotel, Atlanta, Ga.

Feb. 7-9. N. Y. Garden Supply Trade Show, Kingsbridge Armory, New York City.

Feb. 15-17. Calif. Weed Control conf., Sacramento & Davis, Calif.

Feb. 15-17. Western Weed Control conf., Sacramento & Davis, Calif.

Feb. 20-21. Southwestern Branch, Entomological Society of America, Ft. Worth, Tex.

Feb. 22-24. Ohio-Ind. conf. on Agricultural Aviation, Ohio State Univ., Columbus, O.

March 6-7. Western Cotton Production conf., Fresno Hacienda, Fresno, Calif.

March 14-18. National Agric'l Chemicals Assn., spring meeting, Hollywood Beach Hotel, Hollywood, Fla.

March 28-30. North Central Branch, ESA, Purdue Memorial Union, Lafayette, Ind.

... Where
Highest Quality
Urea Nitrogen
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Grand River Chemical Division of
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TULSA, OKLAHOMA

GOVERNMENT

New Mo. Pesticide Act Now Effective

Effective January 1, the new Missouri Economic Poisons Act of 1955 and related regulations went into effect. The regulations were adopted at the conclusion of public hearings in November at which the Act and rules were discussed by a panel headed by L. C. Carpenter, state commissioner of agriculture; Stirling Kyd, extension entomologist; Earl Straub, head of the state feed and seed division, department of agriculture; and Julius R. Anderson, state entomologist. Health departments and ten major chemical companies were also represented at the meeting.

The law calls for registration of all economic poisons distributed, sold or deferred for sale within the state or transported into or within the state. It is aimed at bringing the state's regulations in line with USDA rules and provides for seizure and condemnation proceedings for unregistered, adulterated or misbranded, improperly colored, inadequately labeled economic poisons. Violations are punishable as a misdemeanor.

Applications for registration forms are obtainable from the Missouri Department of Agriculture at Jefferson City.

Farm Costs Seen At 1955 Average

Farming costs in 1956 are expected to average about the same as last year, according to Dr. K. L. Bachman, USDA economist. Fertilizer costs per pound are expected to remain at about 1955 levels with some slight decline possible, said Bachman, pointing out that cost rates of plant foods have been dropping since 1952.

Although higher prices are anticipated in many of the indus-

trially-produced items used on the farm, conditions portending lower average feed and seed prices are expected to provide a balancing factor.

Challenge Montana Tax Benefit Laws

Under consideration by the Montana supreme court is a case challenging constitutionality of a 1951 state law giving industry tax benefits the first three years it is on an assessment roll.

The case originated in Silver Bow county where Victor Chemical Works, engaged in phosphate production, enjoyed benefits of the law in 1951 but was denied them the following year under an opinion by the state attorney and an order by the state board of equalization.

Designed to encourage new industry, the law provides industrial property shall be taxed on only seven per cent of assessed value for the first three years and the regular rate of 30 per cent thereafter.

It is challenged on the contention that it violates a state constitutional provision that tax levies must be uniform.

Entomologist Sent to Libya by USDA

Entomologist Arthur Kaatz has been assigned to Libya by USDA to provide technical assistance in insect control. With headquarters at Tripoli he will work with that country's plant protection officials in programs to control crop and livestock insects, particularly the grasshopper.

In addition, a pilot is being stationed in Libya to help train local personnel in use of planes for crop protection work. This is the 10th Near East country to receive such assistance.

ICA Authorizations

Republic of Korea. \$19.5 million—fertilizers (PA No. 89-230-99-A6-6005). Contract period: 11/30/55-5/31/56. Source: World wide. Terminal delivery date: 6/30/56. Includes nitrogenous fertilizers, \$17.5 million, and phosphatic fertilizers, \$2 million. In case of tie bids with all other conditions equal, awards will go to bidders having barter agreements with CCC.

Vietnam. \$350,000—nitrogenous fertilizer (PA No. 30-230-99-70-5014). Contract period: 12/1/55-3/31/56. Source: World wide. Terminal delivery date: 6/30/56.

\$350,000—phosphates and mixed fertilizers (PA No. 30-235-99-70-5015). Contract period: 12/5/55-3/31/56. Source: world wide. Terminal delivery date: 6/30/56.

Changes in Virginia Chemistry Division

In Virginia, the former Division of Chemistry of the state Department of Agriculture is now the Division of Chemistry and Foods under the direction of Rodney C. Berry, state chemist. Administration of all laws relating to foods, feeds and animal remedies has been transferred to this division.

It will continue to supervise the general chemical and physical laboratories of the department and the administration of laws regulating sales and distribution of fertilizers, pesticides, limes, gasolines and paints.

M. B. Rowe is supervisor for fertilizers, limes and gasolines; J. Claggett Jones for pesticides and C. F. Bruce for seeds. Correct address for the division is: Division of Chemistry and Foods, Va. Dept. of Agriculture, 1123 State Office Bldg., Richmond 19, Va. Telephone numbers include Berry, 2-5897; Rowe and Bruce, 2-8341; and Jones, 2-5897.

FARM CHEMICALS



A thousand "eyes" watch the quality



Result:

uniformly fine texture with
International's new
TRIPLE Superphosphate

The control room pictured above is the nerve center of International's vast plant at Bonnie, Fla. Last word in automation, it assures precise quality control of every step in the production of Triple Superphosphate.

Combined with natural air curing, it achieves uniformly small particle size and the correct chemical structure to deliver a higher percentage of available P_2O_5 — 46% or more.

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Phosphate Chemicals Division • General Offices: 20 North Wacker Drive, Chicago 6

Associations & Meetings

Fertiliser Society Spring Meetings

The Fertiliser Society (of England) has announced its program for meetings, January through May, 1956:

Jan. 12—"The Effect of Sampling on Fertilizer Analysis," by E. W. Schwehr; Feb. 23—"Residual Effects of Fertilizers," by R. G. Warren; March 22—"Good Quality Granular Fertilizers. Some Research and Manufacturing Problems," by B. Raistrick; May 31—"Use of Fertilizers for Glasshouse Crops."

The first three meetings are to be held at the Lecture Hall of the Geological Society, Burlington House, Piccadilly, London, while the latter will be held at the Fernhurst Research Station, near Haslemere, Surrey.

First PR Meetings Scheduled by AMA

The first conference on public relations ever to be conducted by the American Management Association will be held January 19-20 at the Hotel New Yorker, New York City.

Designed for business and industrial executives with public and community relations responsibilities, the meeting will feature nine addresses describing latest techniques in telling the com-

pany's story to employees and the public.

NAC Board Meets, Safety Discussed

At the board of directors meeting of the National Agricultural Chemicals Association, held in Wilmington, Del., Nov. 8-9, plans were discussed for an expanded educational program on safety and safe use of pesticides and for boosting the use of pesticides in relation to stored grain, grasslands and forage crops, plant diseases and soil insects.

Attending the meeting were G. C. Romig, American Chemical Paint Co.; Charles H. Sommer, Jr., Monsanto Chemical Co.; Fred W. Hatch, Agr. Chem. Div., Shell Chemical Corp.; Loren P. Scoville, Chlorinated Products Div., Diamond Alkali Co.; Fred Shanaman, Pennsylvania Salt Mfg. Co. of Washington; Paul Mayfield, Naval Stores Dept., Hercules Powder Co.; W. W. Allen, Dow Chemical Co., NAC president; James D. Hopkins, Hopkins Agricultural Chemical Co.; L. S. Hitchner, NAC executive secretary; E. H. Phillips, G.L.F. Soil Building Service; J. V. Vernon, Niagara Chem. Div., Food Mach. & Chem. Corp.; Wm. J. Liipfert, Woolfolk Chemical Works; and Chester M. Brown, General Chemical Div., Allied Chem. & Dye Corp.



Clockwise: Romig, Sommer, Hatch, Scoville, Shanaman (standing), Mayfield, Allen, Hopkins, Hitchner, Phillips, Vernon, Liipfert, Brown.

New Officers for Fert. Section, NSC

New officers of the Fertilizer Section, National Safety Council, include Curtis A. Cox, Virginia-Carolina Chemical Corp., general chairman; E. O. Burroughs, Jr., F. S. Royster Guano Co., vice chairman; R. G. Diserens, Phillips Chemical Co., secretary.

The group reports that Yen Shen of Taiwan Fertilizer Co., Taiwan, China, is now a member of the executive committee. It hopes to obtain membership not only from this country and Canada, but throughout the world.

NPFI Convention To the Greenbrier

The 1956 annual convention of the National Plant Food Institute is scheduled for The Greenbrier, White Sulphur Springs, W. Va., June 10-13, 1956.

New MCA Program, Staffer, Members

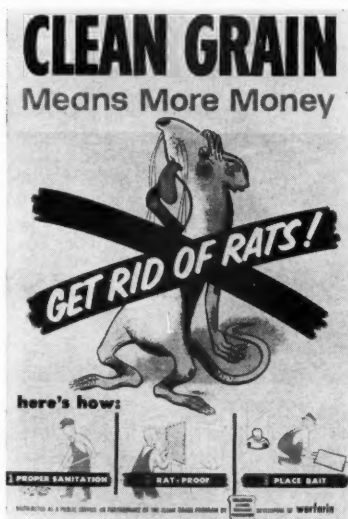
C. Alphonso Smith has joined the staff of the Manufacturing Chemists' Association as director of publications. In addition to general writing assignments, he will serve as editor of *CHEMICAL NEWS*, MCA's bimonthly newspaper, and will be responsible for development of the association's over-all publications program.

The group has announced that it will soon embark on a program designed to assist science teachers and students in junior high schools. Pilot program for the present year involves preparation, use and testing of materials such as a teacher's source and experiment book, student experiment booklet, wall chart and vocational guidance publication.

Four new MCA members include Goodrich-Gulf Chemicals, Inc.; Mobay Chemical Co.; Pitt-Consol Chemical Co.; and United Rubber & Chemical Co.

Warf 'Clean Grain' Poster Available

"Clean Grain Means More Money"—that's the theme of the colorful new poster available from Wisconsin Alumni Research Foundation. Intended for dis-



play in elevators, mills and other businesses in the grain handling industry, the poster is being offered in furtherance of the national "clean grain" program.

Single copies or quantities may be obtained free of charge from Educational Director, Wisconsin Alumni Research Foundation, P. O. Box 2217, Madison 1, Wisc.

Grange Criticizes Old, New Supports

A program recently was outlined by the National Grange for "rebuilding family-farm income without dependence upon Government handouts." Calling for a strong commodity-by-commodity approach to critical production, price and marketing problems, the Grange criticized both the old 90 per cent of parity rigid price supports and the current flexible price support program as inadequate to meet current and future needs of the great middle-income group of farmers.

The Grange recommended:

1. A vigorous export sales program at competitive prices to regain a fair share of world markets for American producers. This would include trade with Iron Curtain countries.
2. Expansion and strengthening of soil and water conservation programs.
3. Use of two-price or multiple-price, self-financing measures for such commodities as can use them.
4. Development of farm programs on a commodity-by-commodity basis.

Announce Winning Conservation Essay

Byron E. Moyer, 21, Middletown Springs, Vt., has been named national winner of \$500 in the 1955 Conservation Essay Contest, sponsored by the National Plant Food Institute and National Grange.

Program Set for GPFES Meeting

The Georgia Plant Food Educational Society reports that an excellent program has been prepared for its 1956 joint meeting with the Georgia Section of the American Society of Agronomy, to be held January 17 at the University of Ga., Athens. Included will be a discussion of the functions and future plans of the newly reorganized Fertilizer Div. of the Ga. Dept. of Agriculture, by Phil Campbell, Ga. Commissioner of Agriculture; "Tools for Selling Fertilizer," by W. R. Allstetter, National Plant Food Institute vice president; and a discussion of the activities of the society and plans for the coming year. Banquet speaker is scheduled to be Dr. M. B. Russell, head of the Agronomy Dept., University of Illinois.

The ASA program will continue on January 18.

NPFI Soil Builders Winners



Winners in the National Plant Food Institute's Annual Soil Builders Award for Editors' contest were honored at the Nov. 30 meeting of the American Agricultural Editors' Association. Above, Louis H. Wilson, secretary and director of information for NPFI, who presented the awards; E. W. McMunn, immediate past president of the association; George Johnson, associate editor of *SUCCESSFUL FARMING*, winner in category of magazines with more than 300,000 circulation; Homer Fine, associate editor, *THE NEBRASKA FARMER*, who received award on behalf of Carl Deitemeyer, managing editor, in the class of magazines with less than 300,000 circulation; and T. J. Anderson, newly elected president of the association.



Three of the A.A.C. Co's electrically-operated draglines at work at our phosphate mines in Central Florida. Bucket capacities range from $9\frac{1}{2}$ to 17 cubic yards. The 17-yard draglines with their 175-foot booms each weigh more than a million and a half pounds and can move 35,000 tons of material in 24 hours. From these rock deposits flow a continuous stream of high quality phosphate rock, assuring a dependable source of supply of AA QUALITY phosphorus products, see list below.

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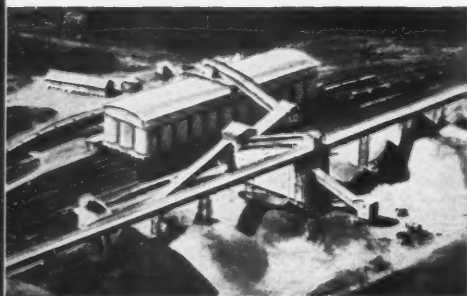
All grades of Complete Fertilizers Superphosphate

Gelatin Bone Products Salt Cake Ammonium Carbonate

Sulphuric Acid Fluosilicates Insecticides and Fungicides

Phosphoric Acid and Phosphates

Phosphorus and Compounds of Phosphorus



From the air—wet rock storage and drying plant, with dry rock storage silos in background. These silos, 29 in number, have a total capacity of 40,000 tons of dried rock. Under the silos are four runways where 40 railroad cars can be loaded at a time.

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39 FACTORIES AND SALES OFFICES SERVING U.S. CANADA AND CUBA—ASSURE DEPENDABLE SERVICE

VIEWING WASHINGTON

with—Farm Chemicals
Washington Bureau

on agriculture

The Administration's new—rather amended—farm program puts most reliance to boost farm income, cut surplus production, and make friends in farm areas on the "soil bank." Other changes the White House will suggest this month to Congress are more or less "fringe" changes, such as more liberalized credit for farmers, expanded surplus disposal, minor changes in support programs, more low-income farmer aid, etc.

The "soil bank" proposal is touted as a surplus-production cutter. But experts predict that while a reduction in production may be gotten during the first year of operation, it will later lead to expanded production. As a Grange official puts it: "A soil bank is like Uncle Sam betting with farmers that they can't boost production . . . Uncle Sam will lose." Farmers will continue to try for higher yields to make up for reduced acreages.

Here's how the soil-bank idea would work: A farmer could make up his own mind to put land—a certain specified amount—into the "soil bank." But if he didn't do it, he'd lose his right to any crop price support.

Land put into the bank would have to stay there for at least 3 years, and "rent" would be paid annually by the Government in cash or by equivalent Government-held surplus goods.

Under the Administration plan, ACP (agricultural conservation program) funds would be increased from the present \$250 million to help pay the cost of seeding grass and legumes on the "banked" land. In addition to putting land in the "soil bank," the Administration was considering encouraging farmers to underplant allotments—and paying farmers the difference for what they might have made on the underplanted acreage.

Cotton growers have voted overwhelmingly again to produce this year under stringent marketing quotas as well as acre allotments. They will be penalized on harvest of more acres than the national 17.5 million allotment, the land officially expected to produce about 10 million bales—under "normal" circumstances. This again puts a premium on boosting yields.

Look for drastic congressional action this year aimed at actually reducing cotton production—and still keeping cotton income relatively high. One thing is almost sure to be done: Changing the staple length upon which price support is based from $\frac{7}{8}$ inch Middling to 1 inch. This would have the effect of dropping support levels about 3 cents a pound.

Flue-cured tobacco growers are in for a further cut in acreages this year. Inside Agriculture Department planning is based on a cut of 130 million acres in addition to a 110 million acre cut already announced for 1956. This would require congressional action.

Reason for the bigger reduction: The Department under-estimated the size of the 1955 crop when it announced the first reduction back in July.

Corn acre allotment will be chopped back—but the cut is not likely to have much effect on actual plantings. At press time, the Agriculture Department was planning on a 1956 corn allotment in the "commercial area" of about 45 million acres, compared with 50 million last year.

Because price support is almost certain to be lower this year—many more farmers are expected to ignore allotments and forego price support. Officials privately feel that corn plantings will again be around 55 million acres in the Corn Belt—total over 81 million nationally.

VIEWING WASHINGTON

on business

New billion dollar highways program will be legislated by Congress this year. There's almost unanimous agreement among lawmakers that 1956 is the year for it. Last year's fight over financing of the vast program—which delayed passage until this year—is not expected to be repeated in the same degree. The White House has indicated willingness to compromise—making passage virtually assured.

Expanded fertilizer market will probably result from the big roads program. The roads will need grass on the sides and in between lanes. To get good stands, adequate fertilizing is necessary, according to Federal roads officials who will administer the US part of the program. Exactly how this would function, who will do the purchasing, etc., won't be settled until the legislation finally is passed and authority delegated.

Administration highways program contemplate \$101 billion in total expenditures in 10 years. The Federal government would contribute \$31 billion, of which \$25 billion would be for an interstate system. Federal share would be financed by bonds. Democrats favor the Gore bill, which authorizes \$24.5 billion (projected for 10 years), of which \$15.5 billion would be for the interstate system. The Gore bill does not include a method of financing, although use taxes would be part of the set-up—to be embodied in a special tax bill.

Another boost to fertilizer sales will come from the Administration's "soil bank" proposal. Under this scheme, designed primarily to get more cash into farm hands, the government would pay farmers for taking land out of production—and pay to get stands of grass, legumes and trees on this land. A certain percentage, perhaps 10 per cent, of farm land would thus be retired temporarily—kept in the "soil bank." These payments apparently would also go to help defray the cost of plant foods for getting stands started.

Addition of antibiotics and other drugs to livestock feeds is causing new problems for drug manufacturers, feed manufacturers and regulatory officials, according to Food & Drug Administrator George P. Larrick. To clear up the problems, FDA will conduct a symposium, January 23–24. Commercial feed manufacturing is a \$3.5 billion industry. It has become a major market for drugs such as hormone-like substances and antibiotics. These materials are added to feeds in extremely small proportions. Under the law such feeds are required to contain, at the time of purchase, the amounts of drugs which are declared on their labels. The symposium is designed primarily to educate industries as to the handling of drugs in feeds in the light of food and drug law.

Recent uptrends in plant and equipment spending are expected to continue during the first quarter of 1956. According to the Commerce Department and the Securities and Exchange Commission, business plans to spend at a seasonally adjusted annual rate of about \$31½ billion in the first quarter—compared with \$31 billion in the last quarter of 1955, and actual outlays of \$29½ billion in the third quarter of 1955.

Cash dividend payments by corporations issuing public reports amounted to \$699 billion in October, says the Commerce Department. This brought up the total for the first 10 months of 1955 to \$7.7 billion, or almost 10 per cent above the same period of 1954. The chemicals industry boosted dividend payments from \$477.3 million in the first 10 months of 1954 to \$551.3 million during the same period of 1955.

Chemicals

1—Attacloy

Minerals & Chemicals Corp. of America has issued a new 8-page technical bulletin designed to aid you in developing the important market for granular pesticides in corn borer control. Its product is highly sorptive, combines well with toxicants and shows excellent resistance to breakdown in processing and field application. On the spot availability is offered of five mesh sizes. For a copy

CIRCLE 1 ON SERVICE CARD

2—Barden Clay

A four-page folder from J. M. Huber describes Barden clay and the properties of this low-cost kaolin carrier-diluent. Specially prepared for organic chemical pesticides, it can be used as a diluent for finished dusts, carrier for dust bases and wettable powders, and as a conditioner for sulfur. Two pages are devoted to a discussion of factors such as particle size and shape, adhesiveness, adsorbency, suspension, compatibility and mortality.

CIRCLE 2 ON SERVICE CARD

3—Horse & Lion

Horse & Lion nitrogen materials distributed here and in Hawaii exclusively by Atkins, Kroll & Co. include five different types and concentrations for your requirements—calcium nitrate, calcium ammonium nitrate, ammonium sulfate nitrate and urea (coated pellets for dry use, uncoated for liquid application, or dry where fast dissolving is desired). For information and prices

CIRCLE 3 ON SERVICE CARD

4—Bonnie Super

Quality control of triple superphosphate production at International Minerals & Chem. Corp.'s Bonnie, Fla., plant is assured by the completely automated control room. Combined with natural air curing, this provides an end product with uniformly small particle size, correct chemical structure and a higher percentage (46 per cent or more) of available P_2O_5 . For sample and quotations, fertilizer mixers can

CIRCLE 4 ON SERVICE CARD

5—Nitro-form

Nitro-form, 38 per cent urea-form nitrogen material from Nitro-form Agri. Chemicals, is described in a new four-page bulletin which includes data covering its application on a variety of horticultural and farm crops. The first commercial urea-form to be placed on the market, it is attracting wide-spread interest among progressive mixers. For more information

CIRCLE 5 ON SERVICE CARD

6—Versen-OL

A new iron chelate from Dow Chemical, Versen-OL, is now available for use in prevention and cure of iron chlorosis on both acid and alkaline soils. A second product, Versen Iron Chelate, is specially suited to acid soils. Absorbed on moisture-controlling vermiculite, they are ready for pre-mixing with your fertilizers. Information and bulk price data is available.

CIRCLE 6 ON SERVICE CARD

How to use the READER SERVICE CARD

- Circle number of literature you want.
- Print or type your name, position, company and address.
- Clip and mail the Service Card.

7—Cyanamid

American Cyanamid is a prime source of supply for a variety of basic fertilizer materials including ammonium sulfate, three grades of nitrogen solutions, anhydrous ammonia, phosphate rock in a variety of grades, and, of course, pulverized cyanamid. For complete information on the Cyanamid line

CIRCLE 7 ON SERVICE CARD

8—Methyl Bromide

Methyl bromide is now being produced by Kolker Chemical at Newark, N. J., and is available packaged in one pound cans with 2 per cent chloropicrin as warning agent and in 125, 150 and 450 pound cylinders of 100 per cent methyl bromide. Sales will be handled by distributors throughout the country. For further information

CIRCLE 8 ON SERVICE CARD

Process Equipt.

9—Dry Batch Blender

Quick, thorough mixing and reduced production costs are features of the Sturtevant dry-batch blender. Just one lever controls both receiving and discharging, and a hand wheel operates rack and pinion slide at feed opening. Nine models are available, handling from 10 cu. ft. to 900 cu. ft. batches. A single aperture drum is used for both intake and discharge. For information

CIRCLE 9 ON SERVICE CARD

10—Pulva-Sizers

A new condensed bulletin has been issued by the Pulva Corp. describing its full line of Pulva-Sizer high speed pulverizers. Available in sizes ranging from $\frac{3}{4}$ to 75 h.p. they have found application in the plants of many farm chemicals producers.

CIRCLE 10 ON SERVICE CARD

11—Rotameters

Both aqua ammonia and sulfuric acid are handled by Schutte & Koerting Safeguard rotameters. A rigid steel case enclosing the meter tube provides protection against external shock and insures accurate alignment. Extra wide safety glass windows permit complete visibility while providing additional protection for operator and tube. For information

CIRCLE 11 ON SERVICE CARD

12—Heating Units

Union Iron Works process heating equipment is presented in a four-page bulletin. Various vaporizers, forced circulation liquid heating and cooling units and other items are available for use in heating rotating drums, chemical process equipment, etc. Designed for use with Dowtherm A & E, Para-Cymene, Anisole, Aroclor No. 1248 and heat transfer oil, the units feature simple, uniform control providing high temperatures at low pressure. For a copy

CIRCLE 12 ON SERVICE CARD

13—Purge Meters

The complete Brooks Rotameter line of Brooks-Mite and Sho-Rate purge meters is illustrated in an 8-page bulletin. The units are termed practical, versatile designs for dependable small flow indication. Application data, design and construction details and capacity charts are included.

CIRCLE 13 ON SERVICE CARD

14—Hoses & Ducts

A bulletin from The Flexaust Co. provides latest information and prices on Flexaust hoses and Portovent ducts. Various types are adapted to exhausting fumes from chemical reactions, servicing vibrating hoppers, spraying and dusting and a wide variety of dust collection, fume control and materials handling applications. For a copy

CIRCLE 14 ON SERVICE CARD

Materials Handling

15—Towmotor

The latest issue of HANDLING MATERIALS ILLUSTRATED, published by Towmotor Corp., features a series of case histories including one on Northwest Feed & Fert. Latest improvements in materials handling equipment, including a new automatic transmission available for most of the firms fork lift trucks, are covered in another section.

CIRCLE 15 ON SERVICE CARD

Packaging

16—Kraftpacker

Almost anything that packs into multi-wall paper bags can be handled on Kraft Bag's automatic open mouth bag filling machine, the Kraftpacker. Handling weights from 25 to 200 lbs., it is an automatic unit featuring controls that pre-weigh materials to close tolerances at high speeds, requiring no head of material to maintain accuracy. From 22 to 24 100 lb. charges per minute can be handled with a single operator. For a descriptive brochure

CIRCLE 16 ON SERVICE CARD

17—Testing Boxes

If corrugated boxes are used in your packaging operations, a new Hinde & Dauch booklet will be of special interest. The 24-page affair on how to test corrugated boxes is designed to acquaint you with the importance and techniques of package testing and offers a comprehensive check list by which to judge protective qualities and general efficiency of specific corrugated boxes.

CIRCLE 17 ON SERVICE CARD

18—Auto Scale

The Richardson E-50 scale is completely described in a new six-page bulletin. The unit is electrically controlled, pneumatically operated, completely automatic in operation and has effectively handled a variety of materials including fertilizers and insecticides. Special features include hopper door flapper, different inlet chutes, recording counter, accurate knife edge weigh beam and optional agitator and subsidiary beam equipment. For a copy

CIRCLE 18 ON SERVICE CARD

Application and Storage

19—Schelm Catalog

Schelm Bros. has issued a complete new catalog of its fertilizer solution application equipment including the much-discussed Senesac-Schelm "do-it-yourself" applicator. There are also complete specifications on tractor mounted units, trailer mounted nurse tanks and a variety of miscellaneous items. For a copy

CIRCLE 19 ON SERVICE CARD

20—Marsh Gauges

Gauges for use with anhydrous ammonia equipment are produced by Marsh Instrument with a unique Recalibrator, providing a quick and easy means of keeping instruments accurate under all conditions. Units in various psi ranges are available for use on metering devices, low pressure storage tanks, applicator tanks, field units and bulk storage tanks. For a descriptive folder

CIRCLE 20 ON SERVICE CARD

21—Tryco Applicators

A complete range of field tested nitrogen solution applicators is offered by Tryco Mfg. with construction featuring use of aluminum and stainless steel—wherever solutions contact metal. The firm also has pressure or non-pressure storage tanks in sizes from 100 to 12,000 gallons. For detailed information

CIRCLE 21 ON SERVICE CARD

22—Nitrogen Spraying

Aluminum or stainless steel DeLavan nozzles and accessories are especially designed for nitrogen spraying but are also adapted for application of pesticide formulations. The line includes a select-a-spray unit now completely liquid nitrogen resistant with high capacities and long life. For a catalog supplement with details

CIRCLE 22 ON SERVICE CARD

23—Valves and Couplers

Circle Seal valves and couplers from James-Pond-Clark prevent loss of ammonia vapor and speed transfer of nitrogen solutions. Designed specifically for low pressure use they offer safe and economical service. For information

CIRCLE 23 ON SERVICE CARD

24—Gates Tanks

You can save money, says Gates Rubber, by installing its rubber lined tanks to guard against the corrosive action of nitrogen solutions. Rubber, permanently bonded to the inner walls, provides the protection and increases tank life up to four times that of ordinary steel. Sizes include 8, 13 and 21.4 thousand gallon capacities. For full information

CIRCLE 24 ON SERVICE CARD

25—Tellevel Controls

Your bins won't over-flow if equipped with Stephens-Adamson bin level controls, units that can be wired for your plant conditions and which work with any material which will not aerate. Not only is over-flow controlled, but they can be used to prevent jamming of conveyors and elevators and to control discharge to open bins and bunkers. For a descriptive bulletin

CIRCLE 25 ON SERVICE CARD

Miscellaneous

26—Amercoat

The Amercoat system of controlling rust and corrosion is described in a new catalog. It covers various corrosion resistant systems produced by the company and includes suggestions on the selection of proper coatings and preparation of coating specifications. Various Amercoat tank linings are of special interest to fertilizer solutions distributors because they withstand immersion in ammonia solutions, other nitrogen products and phosphoric acid.

CIRCLE 26 ON SERVICE CARD

See pages 59 and 60 for information
on these Reader Service numbers—

27—Yuille Rubber

30 A&D Spreaders

28—St. Regis Bags

31—Nylo-Seal

29—Weather-Lab

32—Bete Nozzles

33—Acme Bulletin

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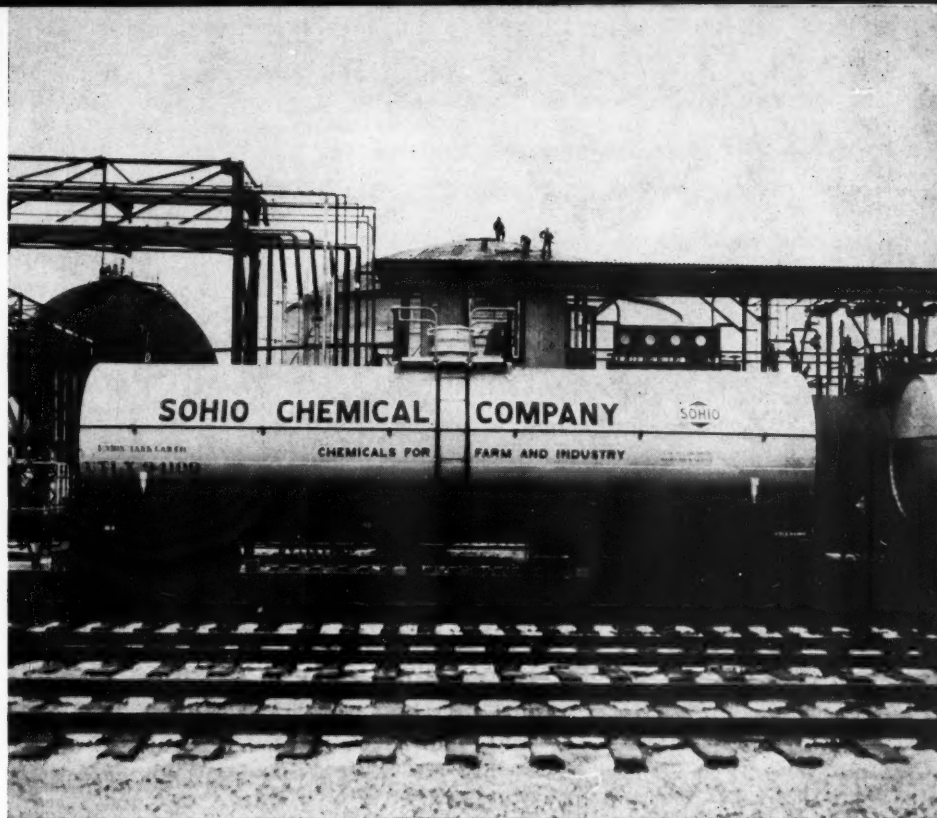
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- MOSS BLUFF, TEXAS
- SPINDLETOP, TEXAS
- WORLAND, WYOMING

First of the Sohio tank cars is shown here at railroad loading facility, part of Sohio's semi-automatic shipping system which incorporates the latest in pneumatic and electrical instrumentation. Sixty railroad cars of liquid materials can be loaded per day at the facilities. Bagged products may be shipped by rail or truck in loose or pelletized loads.



Nitrogen from Sohio

Initial shipment completed;

Full scale deliveries begin this month

INITIAL shipment from the Midwest's newest nitrogen plant, the Sohio Chemical Company installation at Lima, Ohio, was made on December 15 as work continued on construction of final units in the petrochemical operation.

Included in this first lot were a carload each of aqua ammonia, urea ammonia solutions, nitric acid and ammonia nitrate solutions. Some other products were scheduled for early release although the bulk of production was placed in storage to await full scale shipping schedules beginning this month.

Lima was selected as site for the plant, says Edward F. Morrill, president, because of ready access to raw materials and railroad facilities and the central location for both agricultural and industrial markets, close to the heart of the corn belt.

Five major railroads service the town—Erie, B&O, Nickel Plate, DT&O and the Pennsylvania

and their services will be supplemented by a fleet of Sohio truck transports.

Sohio's marketing plans include sales to producers of both solid and liquid fertilizers and for direct soil application. Included in the product line are anhydrous ammonia, aqua ammonia, ammoniating solutions, nitrogen solutions, urea fertilizer compounds and feed grade urea. A selection of 13 combinations of ammonia, ammonium nitrate and urea in the Sohio and Sohioagro solutions line is, according to H. J. Coleman, sales manager, the most complete now offered by any nitrogen producer.

First shipment of urea from the \$17 million plant is scheduled for February and by early May the last unit, a CO₂ plant, is scheduled to go into production.

Plant facilities include an office headquarters building, laboratory building, employee locker building, steam plant, electrical sub-station and five proc-

View of new Sohio ammonia plant at Lima, Ohio. Absorber tower is at far left, scrubber tower at left center and furnace on right.

ess units—ammonia, nitric acid, urea, carbon dioxide and solutions blending.

Ammonia Production

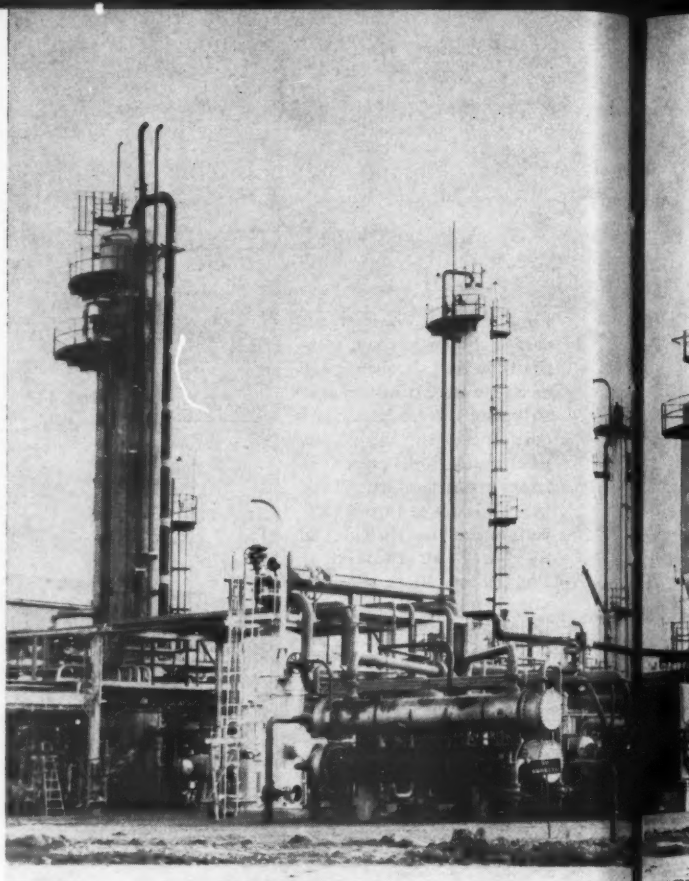
Ammonia, basic material for the plant, is produced by M. W. Kellogg's methane pressure reforming process using natural gas and refinery gas. Special features include a reforming step resulting in 25 to 35 per cent savings in compressor horsepower and a special quench-type reactor permitting optimum temperature control that contributes to improved ammonia yields, lower operating costs and increased catalyst life.

Desulfurized natural gas and refinery gas from the catalytic reformer are partially (about 70 per cent) reformed over nickel catalyst into synthesis gas which flows to a combustion chamber where air is introduced. Gas, steam and air pass through a nickel catalyst where the heat of combustion of the oxygen supplies energy required to complete the reform step and raise the gas temperature to about 1700° F.

Temperature of the gas is lowered as it leaves this unit through direct contact with water sprays in a quench chamber, a step which also provides steam required in the shift converter. In this shift reaction, carbon monoxide in the stream reacts with steam over an iron oxide catalyst to form hydrogen and carbon dioxide.

Now ready for gas purification, feed is sent to a regenerative MEA system for removal of the CO₂ used to produce urea. The synthesis gas is compressed and processed to yield a high purity hydrogen-nitrogen gas.

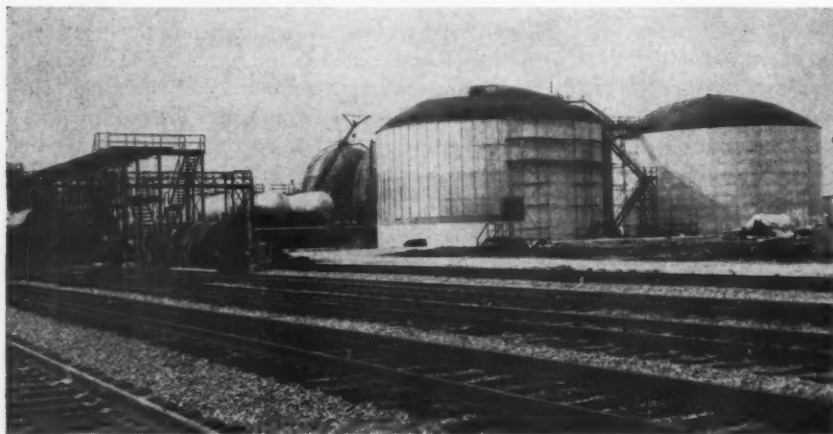
Spent MEA is heat exchanged against hot stripped solution and introduced into the top of a stripping column. Carbon dioxide is stripped from the solution and a portion is used in urea production.



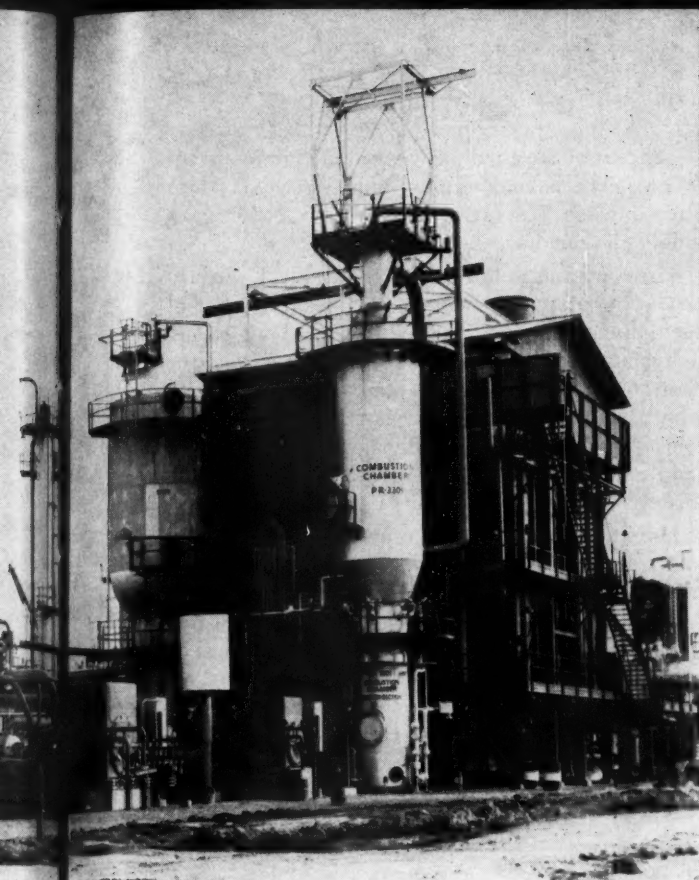
From a CO₂ absorber, process gas flows to reciprocating compressors, then to a CO absorber for removal of remaining traces of carbon monoxide and residual carbon dioxide and through a caustic scrubber.

The gas, now containing hydrogen and nitrogen in a 3:1 volumetric ratio, is fed to a twin convertor circulation system. A combined stream of feed and recycle gases passes through an oil separator, exchanger and an ammonia refrigerated chiller to a separator where liquid ammonia drops out and is withdrawn as product.

Gas from the separator is heat exchanged for recovery of refrigeration and passes to the inlet of the synthesis converters consisting of a catalyst section



A portion of carloading facilities with aluminum ammonium nitrate storage tanks to right, and solutions blending facilities in the background. Ample trackage is designed to accommodate Sohio's large fleet of new aluminum and stainless steel tank cars, each of which measures eighty feet in diameter.



and a heat exchanger.

In the presence of an iron oxide catalyst, a portion of the total hydrogen and nitrogen combines under suitable pressure and temperature to yield ammonia in the effluent from the last catalyst bed. After cooling, most of the ammonia liquefies and is removed from the gas, the latter recycling to the converters.

Inventa Urea Process

Sohio's urea plant is the first in this country to utilize the Swiss Inventa process developed by Holzverzuckerungs, A. G. (Hovag). This method overcomes two major problems of previous urea facilities—the extreme and rapid corrosion in the reactor and the difficulty of separating unreacted carbon dioxide and ammonia.

Prime contractor for the unit was the Vulcan Engineering Division of The Vulcan Copper & Supply Company, holders of Inventa license and rights for the US and Canada. Arthur G. McKee & Company were the constructors.

In the Sohio plant a Hovag developed lining was used in the reactor and is expected to last 10 to 15 years compared to the frequent replacement needed by lead or silver linings which have been used in the past in attempts to overcome corrosion products.

Liquid ammonia and gaseous carbon dioxide are fed to the urea synthesis reactor and subjected to high temperature and pressure under which ammonium carbamate is formed accompanied by liber-

ation of heat. About half the carbamate dehydrates to form urea and water while absorbing a small amount of heat. The net product leaving the reactor is a liquid mixture of water, urea and carbamate.

This mixture undergoes a larger reduction in pressure and passes to the primary decomposer where most of the carbamate is decomposed to ammonia and carbon dioxide. After a further pressure reduction, the mixture flows to a secondary decomposer where most of the remaining carbamate is driven off.

The carbamate-free solution of urea and water is concentrated in a vacuum evaporator, then pumped to the top of the prilling tower. Basis for design and operation of the tower was obtained from a German concern, Friedrich Udhe GmbH.

Prills are dried, cooled, screened to eliminate over and under size particles and dusted with a conditioning agent prior to bagging.

Tail gases from the decomposers containing am-

These four ammonia storage spheres are of high pressure steel. Capacity is ample for storage of off-season production so that even level production can be maintained to enable Sohio to meet peak shipping demands.



monia will ordinarily be sent to the nitric acid and ammonium nitrate plants for ammonia recovery, although separate recycle facilities are included in the urea facilities for this recovery.

Nitric Acid, Fert. Solutions

Designed and built by The Chemical & Industrial Corporation, the 180 ton nitric acid unit burns ammonia and absorbs the oxides formed under a pressure of about 100 psig. The resultant nitric oxide, vaporized water and nitrogen go from the converter through a heat exchanger and waste heat recovery boiler. Cooling and oxidizing of combustion gases, changing NO to NO₂, takes place in a multi-pass, horizontal, cascade-type cooler.

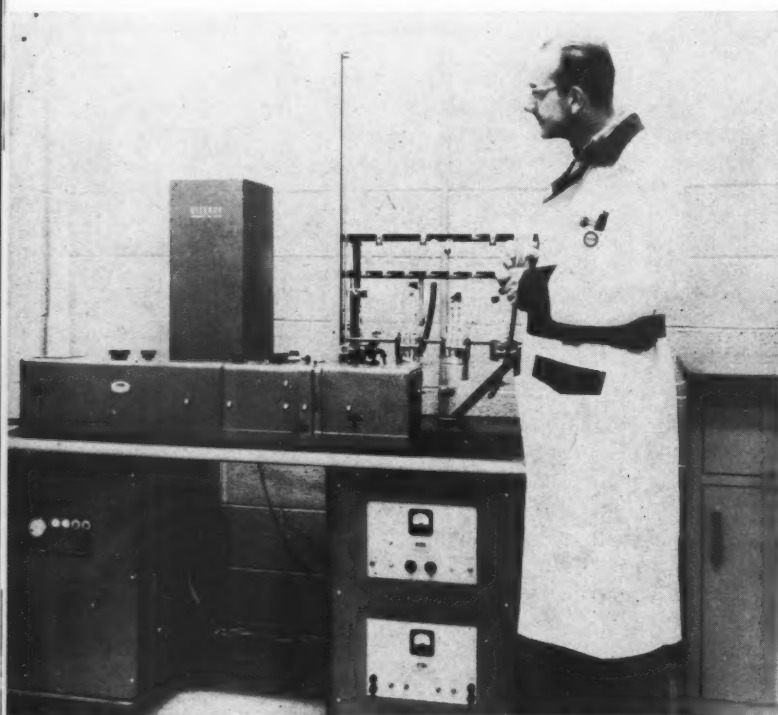
Some acid is condensed here while the gases, mostly NO₂ and oxygen, enter the bubble-plate absorption column from which the resulting acid is delivered to storage.

Urea tail gas and ammoniapurge gas from the urea and ammonia plants are utilized in the ammonium nitrate-ammonia solutions plant, supplying about

80 per cent of the ammonia gas required for neutralization. The balance is pure anhydrous NH₃, also utilized when the urea plant is not operating to supply all ammonia needs.

Nitric acid is added through spargers directly above the ammonia spargers with resulting heat of reaction concentrating the solution to about 83 per cent ammonium nitrate. This overflows from the neutralizer to an adjusting tank where liquid ammonia is added to develop a slightly alkaline condition. From here the liquid passes to a run-down tank and is pumped to storage or to the solution mixer.

Liquid ammonia, 83 per cent ammonium nitrate and water are fed in varying proportions through manually adjustable automatic flow controllers into a baffled mixer for production of ammoniated ammonium nitrate solutions. The resultant heat of solution, which must be removed to prevent too great a rise in vapor pressure, is removed at a sufficient rate to maintain temperature and vapor pressure of the solution at a desired point. ▲



During production of ammonia, various streams in the operating unit are continuously checked by infra-red analyzers to insure constant quality of product. Robert Wadsworth is the chemist.

A mass spectrometer has been installed in plant laboratory for checking feed stocks at operating units and intermediate products. Darrel Dock is the chemist.



PVP-Iodine

in agricultural pest control

By Henry B. Kellog

General Aniline & Film Corp.

THE ingenuity of organic chemists in industrial laboratories has, in recent years, provided a very large number of new chemical compounds. Some of the compounds were synthesized for a particular use or application while others required further study and a systematic investigation to bring fruitful results.

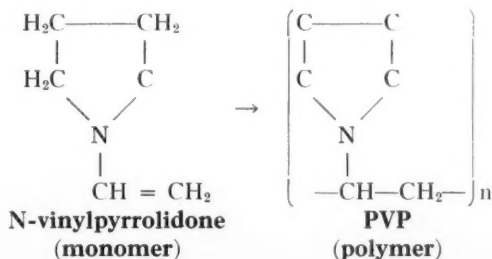
During the past half century the activities of chemists in the field of organic synthesis have swelled our store of information regarding new products to such an extent that most organic chemists have been constrained to focus their interest to some restricted field. Beyond his immediate professional problems, the industrial chemist is generally not so much interested in the countless new organic compounds that are synthesized, as he is in the reaction mechanism, the technique employed in synthesizing a particular compound, and especially in its utility and commercial applicability.

Production of PVP

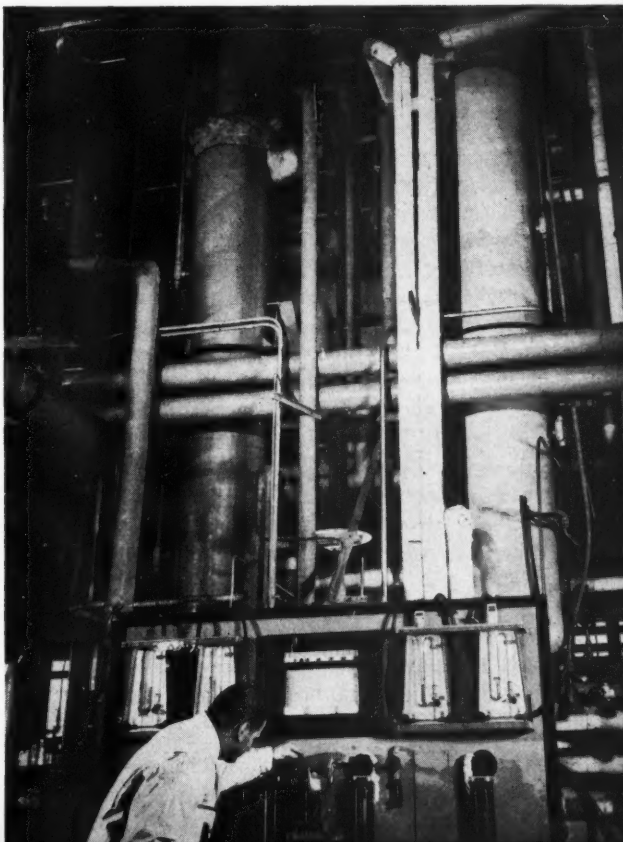
In this article, a brief account is given of the results of study and investigation of the application of polyvinylpyrrolidone, referred to hereinafter for the sake of brevity as PVP. This polymeric compound is so versatile that it finds utility not only in the chemical and pharmaceutical industries, but also in the field of farm chemicals.

PVP is the resulting product of an interesting series of reactions starting with formaldehyde and acetylene as raw materials. During the several reactions, α -pyrrolidone is formed which when treated with acetylene under pressure, in the presence

of a catalyst, yields N-vinylpyrrolidone. Because of the presence of the vinyl group ($-\text{CH} = \text{CH}_2$) it readily polymerizes to form PVP. The relationship between N-vinylpyrrolidone and PVP may be shown by the following formulae:



Purification columns. Each chemical step in the manufacture of PVP is followed by a purification to assure chemical purity of the final product.



N-vinylpyrrolidone will copolymerize with almost all vinyl monomers, e.g., vinyl chloride, vinyl acetate, etc., thus permitting modification of many characteristics such as control of hydrophobic and hydrophilic properties in the copolymer. It is currently employed as a binder, stabilizer, detoxifier, protective colloid, thickener and film former. It has found use in pharmaceuticals, cosmetics, foods, detergents, dye stripping, synthetic fiber additives, size component, in lithography, etc.

The polymeric material, i.e. PVP, in sterilized aqueous solution containing physiological inorganic salts was used extensively in World War II by German army doctors as an emergency blood substitute on the battlefield for treatment of burn shock, in supportive therapy of operations, and in circulatory disturbances resulting from infectious diseases and other causes. The product is said to have saved the lives of tens of thousands of German soldiers.

From the results of this use together with subsequent experimental and clinical studies, it is believed that PVP may answer our military and civilian needs for a superior shock solution when supplies of blood and blood plasma are unavailable.

Agricultural Applications

In the field of farm chemicals PVP is finding use in the preparation of selective herbicides for the control of crabgrass. Compounds such as potassium cyanate, phenyl mercuric acetate and the like, while giving control of crabgrass with very little permanent injury to the basic or desirable grasses, have a tendency to discolor good grasses.

This discoloration, phytotoxicity, is completely overcome by employing a mixture of the herbicide and PVP. The presence of PVP in the mixture acts as a detoxifying agent, and completely eliminates the discoloring effect of the active ingredient on desirable grasses, without impairing, reducing or delaying the herbicidal action against crabgrass.

Aqueous solutions of PVP, and various copolymers thereof may be sprayed on the foliage of certain ornamentals, such as evergreen azaleas, rhododendron, mountain laurel and the like to prevent wilting during transplanting and windburn or excessive transpiration during winter months.

Another matter which accounts for the widespread interest in PVP is the discovery that it combines with iodine, whose germicidal and virucidal properties are well established, to form a compound in which iodine is largely detoxified without losing its therapeutic value. In view of this discovery, research and development are being continued with the hope that it may prove to be a powerful medical weapon.

Of particular current interest is the discovery that the PVP-iodine compound is effective as an insecticide, fungicide, nematocide and soil pesticide. It is not toxic within certain limits of concentration to

plants and warm blooded animals, including man.

The PVP-iodine compound, which is a very stable composition and soluble in water, is readily utilized in the preparation of pesticidal compositions which have no toxic effect as such, or the residues thereof, on plants. Aqueous solutions of the PVP-iodine compound may be employed as such in the form of sprays, or the compound, which is a yellowish-red powder may be employed in the form of dust compositions with a solid carrier such as clay, talc, etc. and applied directly for insect and fungi control.

Pesticide Formulations

Aqueous solutions or dusts containing from 0.1 to five per cent by weight of the PVP-iodine compound control leaf nematodes, *Aphelenchoides ritzema-bosi*; root knot nematodes, *Meloidogyne* species; leaf spot, *Alternaria* species; *Septoria chrysanthemi* and *Cylindrosporium chrysanthemi*.

Aqueous solutions containing from 100 to 1,000 parts per million of PVP-iodine are very efficient in the control and eradication of soil pests such as garden centipedes, i.e., symphilids, *Scutigerella immaculata*, wire worms, white-fringed beetle, beetle grubs and various other soil pests and nematodes.

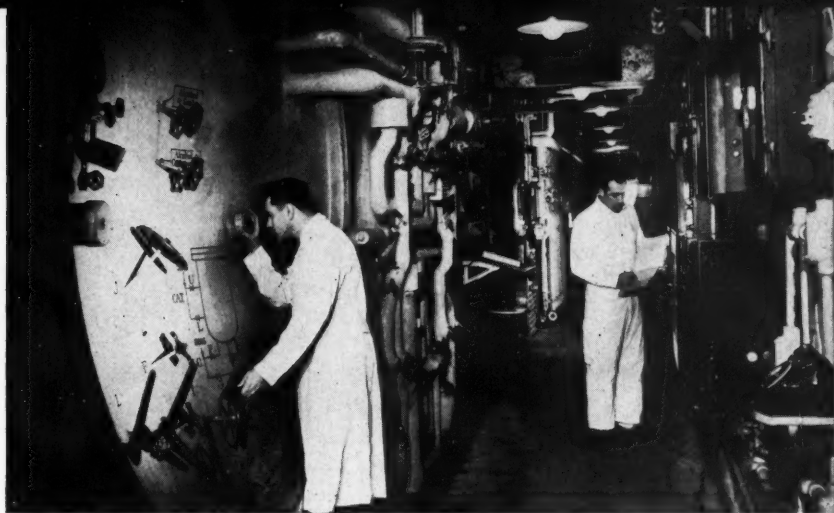
The most outstanding characteristics of the PVP-iodine compound when employed as a pesticide are the following:

1. Complete solubility in water, thus assuring uniform concentrations when employed as insecticides and fungicides, and deeper penetration into the soil when used to eradicate soil pests.
2. Low vapor pressure, thus allowing soil fumigation to proceed over a longer period, and provide for the retention of toxic concentrations of the composition in soil for extended periods. The composition will kill a number of insect species, but will not injure growing plants and aeration is not necessary before planting.
3. In aqueous concentrations, even as high as 20 per cent by weight, the PVP-iodine compound (containing as much as 25 per cent available iodine) is not toxic to warm blooded animals, human beings and plants in general. If the material is accidentally spilled on skin or clothing, there will be no physiological effect, i.e. no injury to skin.

Application of aqueous solutions of the PVP-iodine compound does not require the costly equipment as is the case with the currently used soil fumigating methods such as the employment of steam, applicators for chloropicrin gas, inflammable and dangerous mixtures and the highly toxic ethylene dibromide.

The application of currently available soil fumigants by the unskilled gardener is difficult and involves certain hazards. These disadvantages are completely eliminated by the use of aqueous solu-

This steel barricaded operating corridor makes possible remote control of two steps in manufacturing process of PVP and other high pressure acetylene derivatives—the synthesis of butynediol and vinylation of pyrrolidone.



tions of PVP-iodine compound.

The aqueous solution is merely sprayed on the soil in the concentration of 10–20 per cent by weight, hosed in with water or rain and allowed to soak in. A light application may be made to the top of the soil and the soil rototilled to loosen it up and make it porous and a second application given. Hosing or rain will wash the toxicant into the soil and kill the various insects with which it comes in contact.

PVP-iodine compound has been investigated by several professional entomologists and plant pathologists with the following results:

Other Investigations

Nematodes of the species *Panagrellus redivivus* were killed between two to four hours with an aqueous of PVP-iodine compound, containing 10 per cent available iodine, in a concentration of 1,000 ppm. When the tests were repeated with aqueous chloropicrin of the same concentration, as a standard, a complete kill was obtained in between two to four hours, thus indicating that the PVP-iodine compound was equal to chloropicrin.

Experimental results have shown that a five per cent aqueous solution of the PVP-iodine, containing 12 per cent available iodine, when applied by means of a small camel brush to the dorsal thoracic region of 12 meal worm larvae, *Tenebrio molitor*, killed the larvae after three hours contact. Experimental results also showed that when a 0.5 per cent aqueous solution of the PVP-iodine, containing 15 per cent available iodine, was applied to soil infected with symphylids, *Scutigerella immaculata*, a complete kill was obtained within a matter of four hours. Aqueous solutions were also effective when employed as sprays on chrysanthemums in the control and eradication of the leaf nematode, *Aphelenchoides ritzemabosi*.

When applied in the form of spray, the PVP-iodine gives a substantial kill of red spider mites, *Tetranychus binaculatus*. The same spray applied to aphids, *Macrosiphum sanborni*, gave a kill of 98 per cent.

Initial experiments have indicated that all diseases primarily attacking underground parts, and which are due to soil borne organisms such as root rot caused by fungi (*Pythium*, *Rhizoctonia*), wilt caused by fungi (*Fusarium*, *Verticillium*), root knot caused by nematodes (*Meloidogyne species*), may be controlled by spraying the soil with aqueous solutions of PVP-iodine compound in which the per cent of available iodine ranges from five to 15 per cent.

More Tests and Trials

In view of the promising results obtained with the PVP-iodine compound as an agricultural chemical, it is anticipated that further laboratory tests and field trials will be conducted by qualified organizations and investigators to clearly establish its effectiveness; not only as a general pesticide but also as a specific for some particular destructive insect, soil borne organisms, or fungus on horticultural and agricultural crops.

The purpose of further tests and trials is to apprise the consumer, especially back yard growers, of the limitations of the final product and the manner in which it is to be properly used.

In other words, once the compound receives USDA approval, the label, advertising, etc. will represent the product and properly reflect the actual capabilities, limitations and precautions developed by such tests and trials. Inasmuch as the normal residues of the compound, when used as a spray on plants and crops, are so slight that they are harmless, there is no doubt that the compound and its formulations will comply with the Miller Act.

PVP-iodine is now being produced by General Aniline & Film Corp. on a pilot plant scale for experimental purposes only. It is available for limited sales on ornamental plants to properly qualified commercial organizations.

Reasonable quantities will be supplied to government agricultural experiment stations, universities and similar institutions at no charge. Nationwide marketing is expected and will be announced in due course. ▲

NAC Optimistic on the 1956 Pesticide Outlook

A BIG year for the pesticides industry is forecast by National Agricultural Chemicals Association, following gains in both production and sales activity during the past 12 months. NAC's optimistic outlook for the current year is based on several factors including "one hopeful sign . . . that farmers are beginning to recognize that pest control chemicals can be used to cut unit costs of production . . ."

Other reasons for the comparatively brighter picture than has been seen for some time include:

- Expanding Federal and state roadbuilding programs, most of which call for landscaped roadsides. A growing volume of herbicides will be needed along these roadways on areas which at times total 27 acres per mile of highway. Insecticides and grass growth control agents will also be required.
- Increased use of chemicals for the control of plant diseases.
- The grain sanitation program, requiring control of insects and other pests. FDA has announced a tightening of sanitation requirements on wheat beginning in July, adding that "progressive revision will be made in the light of experience" as inspections are made.

- Forest insects and diseases now causing considerable losses to our standing timber.
- Control of soil insects and other soil pests.

Production-wise it is felt that 1955 may prove to be the second best year for the industry. During the first eight months, said NAC, output was well ahead of the 1954 period with gains of 24 per cent in DDT, 26 per cent in 2,4-D, and 13 per cent in copper sulfate.

Decreases noted in production of lead arsenate (down 12 per cent) and BHC (down 30 per cent) are partially accounted for by the large carry-over stocks from the 1954 season.

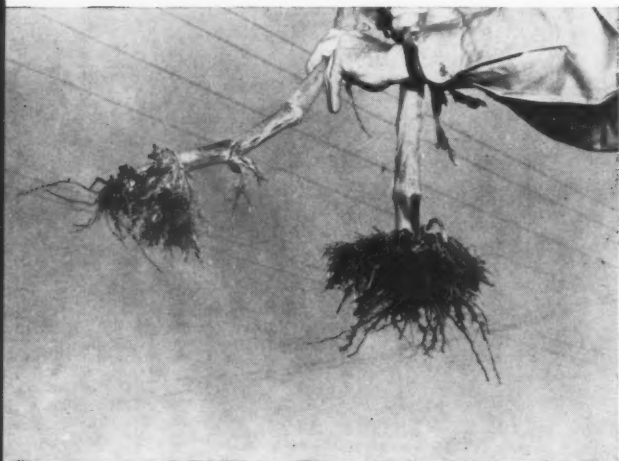
Although production climbed and gains were made in sales volume, profits were again limited by intense competition. Based on production records, USDA estimates that sales will have reached \$200 million at the basic manufacturers level in 1955, indicating farm level sales at from \$300 to \$350 million.

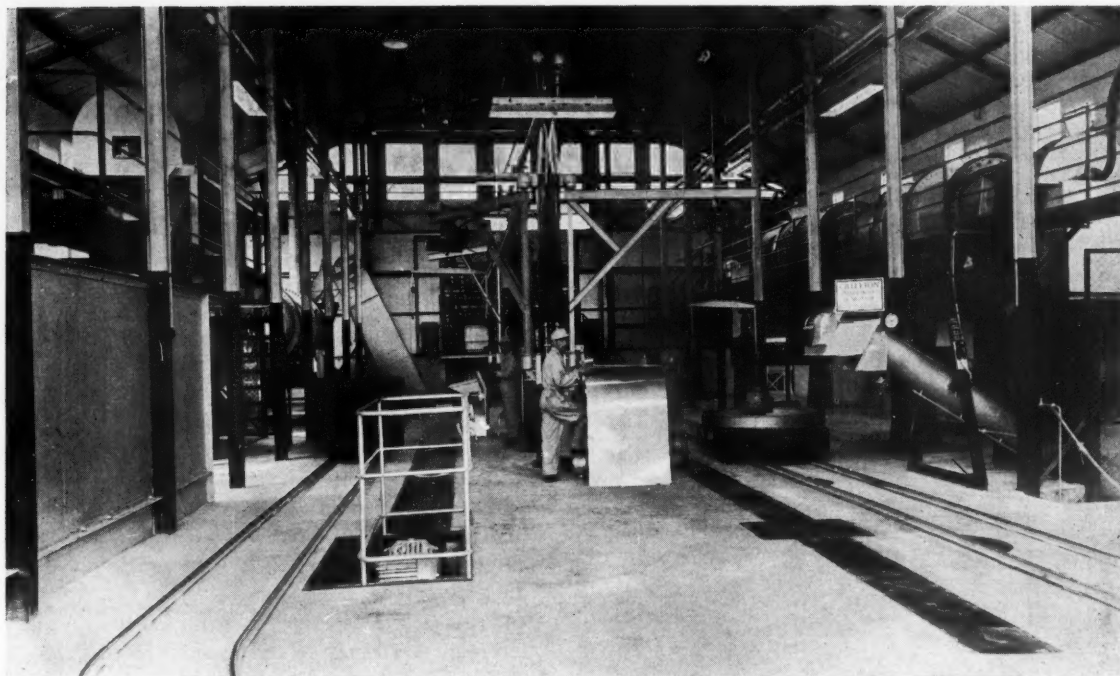
A continued increase in pesticide exports during 1955 was noted by NAC Association with a gain during the first six months of 34 per cent over the same period of 1954. It is anticipated that the final total exceeded \$80 million.

North America remained the largest export market on a dollar basis although big gains were reported in business from other areas—up 250 per cent to India; up 200 per cent to the Philippines; up 80 per cent to Africa; and up 41 per cent to Europe.

Despite the increases registered in both domestic sales and exports, marketing activities were not brought into line with available industry manufacturing facilities and an over-capacity still exists in several major products. ▲

Controls for soil pests are a bright spot in the 1956 pesticide outlook. Graphic comparisons such as this show the farmer the results of chemical control of rootworms and cutworms on corn (right) compared to a root system from an untreated plot.





General view of the Vyner Process Interior.

A new approach to bone products

The Vyner Process

ALTHOUGH bone products now play a relatively small but important part in the production of plant foods, interest in these products has been stimulated by the novel Vyner process for degreasing raw bones. In addition to important financial and production gains, there are aesthetic advantages to an often physically odorous industry.

Developed in Great Britain by Dr. E. M. Vyner, a director of the Sheppy Glue & Chemical Works Ltd., it is a completely new approach which eliminates many of the disadvantages inherent in the usual extraction process plants. As those in the rendering business know, extraction methods are complicated by contamination of fat and other bone products by solvent residues; the high flammability

of solvents used; a lack of continuous process; high steam and power consumption; and the decreasing net revenue derived from end-products.

General Description

Vyner, who began his research in 1948, aimed at a plant that could be operated at high efficiency with complete elimination of waste. The Sheppy firm, feeling that he had accomplished this aim, first erected a pilot plant and, during 1954-55, completed a full-scale operation.

The process itself is still under wraps because licensing details have not yet been completed, but Vyner has provided a general description.

Following his initial study, it was found that fat

contained in the bone cells could be set free, and separated in subsequent operations. After removal of impurities, bones pass through a pre-treater where close control is maintained on the varying conditions required for different raw materials.

By the time the raw material reaches a specially designed slow-running crusher, fat in the bone cells is in such condition that it can be separated from the bones by "thermo-mechanical means," after the bones have been reduced to proper size. Water is

separated from the fat by conventional means.

Vyner claims that the plant processes raw material in a fraction of the time required by extraction facilities and raw material, if immediately utilized, is ready for the glue department in 20-30 minutes, compared with up to 40 hours in conventional units.

Continuous Operation Possible

The Sheppy facilities are operated as a semi-continuous plant although continuous operation is possible. It reports that man-power has been cut to nearly half that required by solvent-extraction processes, steam consumption is 85 per cent lower and electrical consumption is only 50 per cent.

In addition to these cost-cutting attributes, the process demonstrates several other major advantages.

Quality of the fat remains identical to the raw material in color, free fatty acid, rancidity, and other factors.

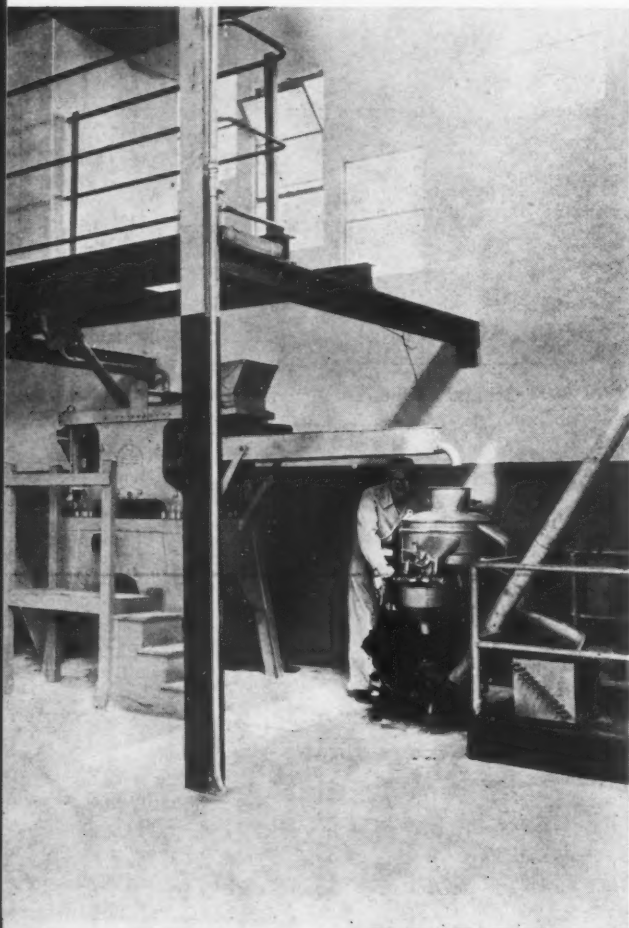
Production of glue is higher in quality and quantity than ever obtained by previous methods.

This is attributed to the fact that the degreased bones, sinews and perisoteum contain the collagen in substantially undamaged form principally because the process never reaches a harmful temperature.

Vitamin content of the by-product feeding materials is virtually unharmed and it is believed this output will be of considerable value. In addition, other characteristics of the feeds are much more agreeable than those of extraction process products.

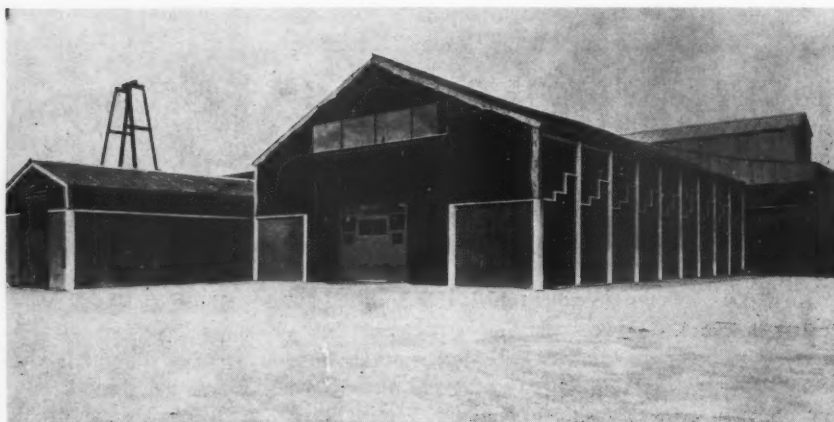
Reception of the process in Britain has been warm and it is termed by the paper "without a doubt the greatest contribution so far towards the complete removal of the stigma which has unavoidably become associated with an industry which has bones as its raw material."

Patents have already been applied for in many countries, Vyner comments, and licenses have been granted for operation of the process outside of Great Britain. ▲



Above: Interior view of Vyner Process shows part of the conventional fat separation & clarification units.

Right: Exterior view of Vyner Process Building.



Cut Your Tax Load

these tips from the American

Institute of Accountants

may aid you on March 15

THIS year, you may be able to cut your tax load whether or not there is a change in the Federal income tax rates. To accomplish this, you will have to know the tax effect of various choices, for the method in which a transaction is handled can raise or lower your taxes.

It may be possible to save through a legitimate shift of taxable income or deductions from one year to another and you are also allowed choices in your treatment of certain items in your tax return, such as depreciation and research costs.

Even at tax-filing time certain money saving steps are possible including the proper choice of depreciation method. The first step in reviewing this possibility is to determine the estimated useful life on any asset acquired during the tax year.

(Note: Don't neglect to obtain a copy of Bulletin F from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. at 30 cents a copy if you carry through on this suggestion. It contains tables of "average" useful lives which can be adapted to your particular needs.)

Straight Line Depreciation

Straight line depreciation is the simplest method and may be your best bet. Divide the cost (less what you expect to sell it or trade it for when replacement time comes) by the number of years of

estimated original life to find the amount to be deducted each year. Don't forget to include freight and installation charges in addition to price of the equipment when determining the original cost.

Several other methods of depreciation are now specifically permitted for new assets having a useful life of three years or more. In one, the declining balance method, depreciation rate the first year is twice that of the straight-line figure. During following years the same rate is applied to the amount remaining to be depreciated. This, of course, permits depreciation of a much greater proportion of the cost during the early years of the asset's life.

Sum of the Years' Digits

Another new method, termed "sum of the years' digits," has a similar effect. Take time to figure depreciation on a new asset in all possible ways so that you can decide the best procedure. Your decision will be affected by estimates of future earnings, tax rates and other imponderables.

The methods outlined may be particularly helpful if you are currently investing considerably in new equipment although depreciation during later years of the asset's life will be less than under the straight-life method.

Research and development, becoming a big item for many firms in this industry, can be treated as

Plant Safety Tip #6

Acid Leak

The Accident: While collecting in a glass container sulfuric acid leaking from a faulty thermocouple an employee sustained sulfuric acid burns of his face and eyes.

During the process the glass slipped and fell to the floor, splashing acid into his face and eyes.

It was the only disabling accident experienced during the year by a multi-plant fertilizer company.

Cause: Defective thermocouple caused the leak.

Comment: The operator should have washed or flushed the acid away with a continuous flow of water instead of trying to collect the small amount which was dripping.

Action Taken: Had the employee worn goggles or other face protection, he wouldn't have been burned by the acid. Use of such equipment was stressed to employees. The location and purpose of emergency showers was again pointed out to workers.



This reduces the area of possible dispute over such matters as value of inventories and has quite a few advantages aside from tax considerations. If you decide on such a change, time it carefully to avoid possible adverse tax effects during the period in which the move is made.

Sick-Pay Exemption

Under present legislation, payments made to employees for treatment of sickness or injury are not taxes as income of the employees. If you have a plan for continuing all or part of an employee's pay while he is absent for sickness or injury, limited amounts of this "sick-pay" are also tax exempt, whether payments are made by the company or by an insurance firm.

When sickness requires hospitalization, even for only a day, during the course of the illness or in the case of any injury the first \$100 per week of payments are tax free. When sickness does not require any hospitalization, the exemption begins after the first week of absence.

immediately deductible expenses or amortized over a period of years.

Although the immediate deduction will be particularly attractive if you need the tax benefit to help finance the program, it may be advantageous to spread the cost over the estimated useful life, or at least 60 months if the useful life cannot be determined. This may be especially advantageous if you are looking for an increase in income.

Partnerships; New Fiscal Year

The 1954 Internal Revenue Code includes a provision allowing some proprietorships and partnerships to be taxed as if they were corporations. Make this choice only after careful review for there is much uncertainty about the provision and it might well be better to actually incorporate if you want corporate tax treatment.

Changes in fiscal year can now be made, in some cases, without permission of the Treasury department. It is usually considered best to use a fiscal period corresponding most nearly with the annual cycle of business operations, ending at the low point of receivables, inventories and loans, instead of a calendar year.

When you contract for repairs or improvements to your company property, be sure that the two types of work are billed separately. If lumped together, the entire cost may have to be capitalized for future depreciation but by listing repair costs as a separate item, you can deduct them as an expense of the current year.

Good records, naturally a part of efficient business operations, should be maintained so that you have a complete accounting of deductible expenses and can back them up if and when questioned by the government. This is particularly important where out-of-pocket business expenses are concerned such as travel and entertainment of customers and on items which are deductible on your personal income tax return.

One further piece of advice from the American Institute of Accountants, which provided the material on which this article is based. For many businesses, frequent consultation with a qualified advisor is the best means of keeping up to date on tax saving opportunities.

If you already retain a certified public accountant or a CPA firm, tax consultations should be held not just once a year as the date for filing returns draws near, but throughout the year as decisions are made which will affect your tax situation. ▲

New in Plant Pathology

Atlanta, Ga., was the site, December 28-30, for the 47th annual meeting of the American Phytopathological Society. Here are briefs of a few of the many papers presented there, those that seem of particular interest to the pesticides industry.

Control of brown rot of corn, important in the Southeast, may be possible through sprays of Orthocide or Fermate for four weeks prior to silking. Twice-weekly applications gave complete control, fewer but more timely treatments greatly reduced infection and loss of corn by stalk breakage. The methods have been tried in research studies only.

JAMES W. BROYLES, *Mississippi State College*

Certain fatty acids show promise for control of nematodes. One, undecylenic acid, prevented further hatching of tobacco nematode cysts after immersion of the cysts for 30 minutes in a two per cent acid-water preparation. Another, pelargonic acid, was completely effective as both dip or spray for burlap potato sacks infested with the cysts. The acids are termed relatively safe to humans and easy to apply.

A. C. TARJAN & P. C. CHEO, *Univ. of Rhode Island*

Good eradicans have been found for three almond tree diseases—brown rot, coryneum blight and scab. Brown rot was controlled with dormant sprays of sodium pentachlorophenate, dinitro-O-sec amyl phenol and a mixture of the two; the others were controlled by dormant application of N-phenyl-mercuriethylenediamine.

E. E. WILSON & J. M. OGAWA, *Univ. of California*

Victoria blight fungus, an oat disease, is now known to attack green beans, including Wade, Contender, Tendergreen, Black Valentine, Bountiful and Tenderlong. 15 varieties.

T. T. HEBERT & N. W. WINSTEAD, *North Carolina State College*

Internal browning of tomatoes is caused by tobacco mosaic virus, as suspected for some time. No practical control is known, but the virus often occurs in such weeds as horse nettle, ragweed, Canadian thistle and plantain near infected tomato fields.

JOHN S. BOYLE, *Pennsylvania State University*

Twice-weekly sprays with zineb for control of downy mildew fungus boosted income from an acre of lettuce nearly \$500, increased production 64 per cent. Mildew control resulted in only 25 per cent more marketable heads but the greater size of sprayed heads made the big difference in per-acre income. Zineb proved the best fungicide tested when both disease control and lack of toxic damage of plants were considered.

R. S. COX, *Everglades Experiment Station*

Treatment of orchard soil with carbon bisulfide before new apple trees are set out can prevent black root rot. A test showed only one of 71 trees planted after treatment was killed. but 10 of 56 in an untreated plot died.

CARLTON F. TAYLOR, *West Virginia Ag. Expt. Sta.*

Experiments have shown allyl alcohol effective in control of several Florida vegetable seed bed fungus diseases. Soil drenches reduce the root rot organisms while encouraging still another fungus that apparently attacks and destroys the rot factors. Treatment has been made as late as a week before seeding without damage to crops.

A. J. OVERNAM & D. S. BURGIS, *Gulf Coast Expt. Sta.*

Damage to peppers by vein-banding mosaic disease, a virus, can be reduced by delaying, if not preventing, movement of carrier aphids from nightshade source plants to peppers since the pests retain the virus less than an hour. A combination of these practices should greatly reduce infestation: spraying nightshade infested weedy areas surrounding pepper fields with an aphicide; keeping an area around the fields free of weeds or fallow; and by planting a non-susceptible buffer crop between peppers and nightshades.

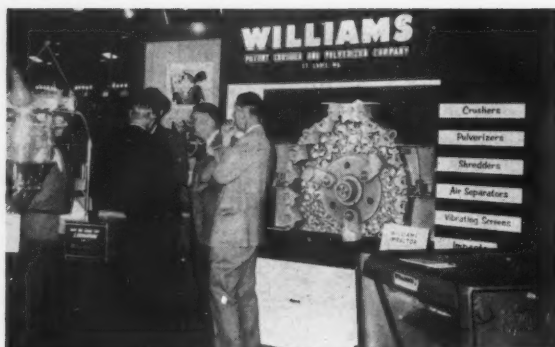
JOHN N. SIMONS, *Florida Expt. Sta.*

Some nematocides apparently exhibit some degree of selectivity, according to one series of tests. Ethylene dibromide or nemagon proved superior to D-D in controlling the sting nematode in tests on soybeans, corn and sweet potatoes. Against the root knot nematode, D-D and EDB showed about the same degree of effectiveness.

QUINTON HOLDEMAN, *South Carolina Agr. Expt. Sta.*



Roto Louvre Dryer on Display at the Link-Belt booth. Also exhibited were a Bulk Flo unit and liquid screen.

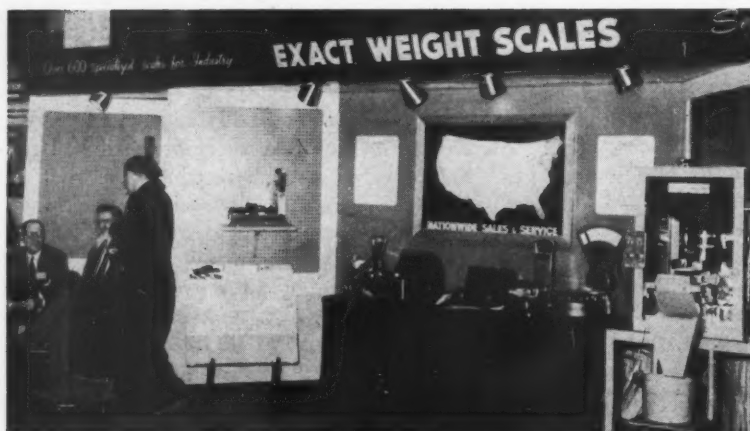


Model of mechanical air separator and hammer mill. Cutaway of Impactor was center of the Williams Patent Crusher & Pulv. exhibit

Portion of Min. & Chem. Corp. of America booth, featuring artists' conception of its new Menlo Park, N. J. research center & offices.



A Tour of the 25th Chemical Industry Exposition



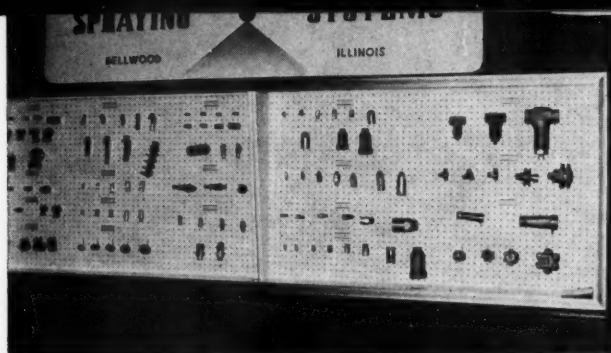
One of the first booths to be seen when entering Philadelphia's Convention Hall to visit the 25th Chemical Industry Exposition was that of Exact Weight Scale Co. Standard and check weigh units and an automatic net weigh machine were displayed.

Just barely visible on the left in this shot of the Sturtevant Mill co. booth is part of a lab roll jaw crusher. In the right center is a micronizer grinding machine. Backdrop showed cutaway views of Sturtevant equipment.



Backdrop for this portion of the Dicalite Div. Great Lakes Carbon Corp. exhibit emphasized the firm's 25th anniversary. Samples of Diatomite products and of Nerofil were on display.





Spraying Systems, Inc.'s diverse line of products were presented on these wall boards, desk displays.



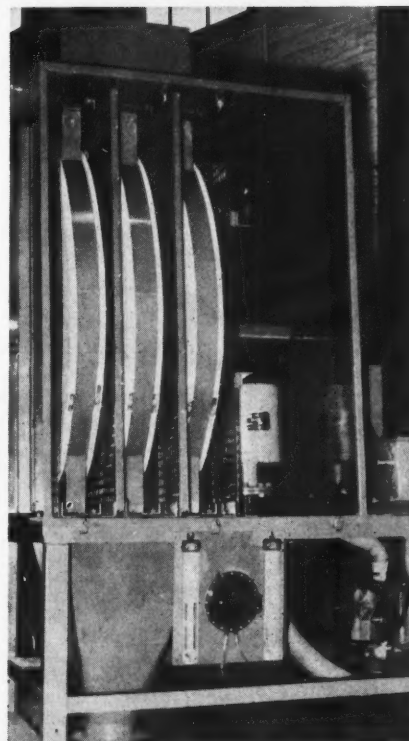
Two models of Frank G. Hough Co. Payloaders, the HAH (shown at right) and also the HA were on the floor at Convention Hall.

Chemical Industry Exposition



The Metal Products Div., Koppers Co., displayed two dust control units, including the Aeroturn bag dust filter at right.

The products of several pesticide producers are prominent in this rack, part of Rheem Mfg. Co. display. Also shown were 55 gal. drums, other units.



Staff of the Chemical & Industrial Corp. exhibit and visitors discuss the German-built model of a 120 ton/day nitric acid plant which was featured in the C&I booth.



CFA Panel on Sales

A TOP fertilizer salesman appears, from comments of one panelist on the program of the recent California Fertilizer Association convention, a combination of qualities not too often uncovered; he is endowed with the outlook of a GM executive, extrovert nature of Happy Chandler, tenacity of Maryland's Pellegrini and other, equally outstanding attributes.

As outlined by Dr. Guy F. MacLeod, Sunland Industries, Inc., his five basic characteristics include emotional stability, sound basic philosophy, pleasant appearance and speech, the nature of an extrovert and maturity. All are termed hereditary, supplemented by environmental conditions, including education.

This salesman, he continued, must be a dedicated member of the company team, completely sold on its policies and personnel. Obviously a prime target for ulcers, his territory and job must be all important, he must see opportunities where they do not exist, worry continually about his problems, enjoy his work as much as his vacation, aggressively plan his life around the agriculturists in his area and do twice as much as any competitor.

It's perhaps fortunate that in view of these pressures he need know, said MacLeod, only a little about a lot of things rather than a lot about a few subjects. The Sunland executive pointed to the need for knowledge of scientific fields such as soils and plants and the related elements of chemistry, physics and mathematics.

Knowledge of fundamental theories, he stressed, is required for proper interpretation in practical applications and to keep up to date on new developments.

To sum up, in MacLeod's words, this individual, "our important cog, the fertilizer salesman. An outstanding personality among all men, a genius in the field of technology, a practical American farmer endowed with all the Yankee instincts that made this country great from its inception to now."

Taking into consideration the somewhat limited number of perfect specimens now available for sales work, Dr. J. E. Knott, University of California, another CFA panelist, still ranks the influence of the fertilizer salesman on what the grower uses, above

Members discuss a top salesman, information sources

that of the Extension Service and Experiment Station personnel.

Knott pointed out that the salesman often calls much more frequently than members of the public agencies and provides the farmer with an advisory service in addition to selling him plant foods.

Salesman can aid considerably in building more knowledge of fertilizer use and crop responses, he continued. By suggesting fertilization of a bed or strip in the field, he can establish a demonstration that will build grower confidence and increase the seller's knowledge.

Where practices have definitely been improved, an even greater service can be provided by reporting such results to extension or experiment station personnel, Knott declared. Such close cooperation will assist in top public service to the grower, he concluded, benefiting all related agencies, including the fertilizer industry.

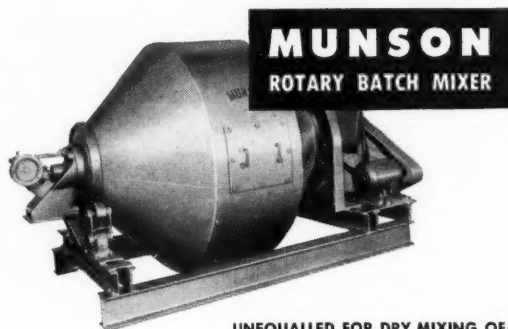
The salesman can obtain information from a wide variety of sources, pointed out F. Haven Leavitt, Shell Chemical, who cited farm, trade and technical magazines; CFA's WESTERN FERTILIZER HANDBOOK; standard and new texts on soil chemistry, fertility and plant growth; and, of equal importance, personal observations.

While publications are of assistance to sales managers, he continued, their best sources of information will be found within their own organizations. Analyze sales records and fieldmen's observations, he recommended, and make a critical analysis of sales by crop and location to determine where effort has been most profitable.

Then compare this with sales potential estimates that can be made on an acreage-rate basis using annual reports made by county agricultural commissions and with a survey of sales personnel. ▲

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accurate blending
of dry ingredients...

...make it a



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You can mix it better and faster in a Munson ... the Rotary Batch Mixer with the **tumbling action** for intimate blending of dry ingredients.

Its famous 7-way mixing action assures extreme accuracy of blend, without grinding or reducing size of ingredient particles.

Munson Rotary Batch Mixers are available in capacities from 20 to 250 cu. ft. The basic Munson design can be altered to fit your individual requirements. Can be fitted with internal spray for introduction of limited amount of liquid.

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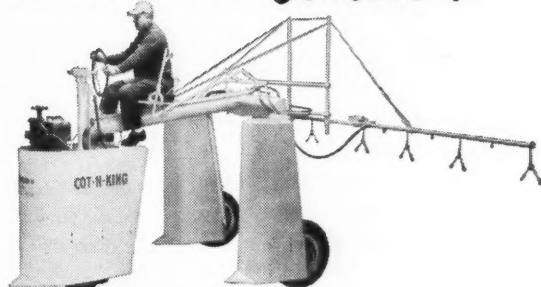


Lifters on inside of truncated cone ends continuously cut out and lift ingredients as drum slowly revolves. Rotating cone tumbles stock.

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months of careful field research
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U.S.D.A. representatives... then
designed the COT-N-KING to
meet their exacting needs... en-
compassing operating speed and
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maximum safety, reduced mainte-
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Chemicals

FDA Tolerances

Allethrin has been denied a blanket exemption from Miller law residue tolerances by the Food and Drug Administration, acting on the basis of a certificate from the Secretary of Agriculture.

Basis for the rejection was the lack of certification that the pesticide was useful in production of all growing crops. Exemption has been granted for allethrin when used prior to harvest on beans, broccoli, brussel sprouts, cabbage, cauliflower, collards, horseradish, kale, kohlrabi, lettuce, mushrooms, mustard greens, radishes, rutabagas and turnips. The exemption does not extend to residues at harvest or after harvest.

Tolerances announced by FDA include: 0.1 ppm ferbam on almonds; seven ppm zineb on mushrooms; seven ppm ziram on strawberries; and 0.1 ppm ziram on almonds and pecans.

Granular DDT for Eur. Corn Borer

Granular DDT is now recommended by North Central states and USDA entomologists for control of the European corn borer. Experiments have shown that granular insecticides have, in general, given as good or better corn-borer control than spray applications.

So far DDT is the only material sufficiently tested in granular form to be recommended.

Control of Mosquito Larva in Irrigation

James B. Gahan, USDA entomologist, has announced results of tests demonstrating that water-soluble insecticides can destroy mosquito larva in irrigation water. Less than an ounce of parathion, most effective of the four insecti-

cides tested, in a million gallons of irrigation water was enough to kill all larvae of *Psorophora* mosquitoes.

Other insecticides that proved excellent were L 13/59, OS 2046 and DDVP, which gave 100 per cent kills at dosages of $\frac{1}{4}$ gallon, $\frac{1}{2}$ gallon and $\frac{1}{10}$ gallon respectively per million gallons of water.

Dextran Used in Soil Conditioning

The American Chemical Society reports that scientists of Commonwealth Engineering Co. have found that small quantities of dextran can be used in boosting fertility of poor soil.

Applied at the rate of $1\frac{1}{2}$ ounces per square foot and mixed to a depth of four inches in garden plots, the materials increased plant growth up to 70 per cent and increased seedling emergence as much as 44 per cent.

It was concluded by the workers that added dextran increases stability of soil aggregates for at least one growing season in temperate climates, but that total effect of this activity over a number of growing seasons remains to be determined.

Polybor-Fungicide Mixtures Tested

Preliminary work conducted by Roderick Sprague, Washington AES, indicates that Polybor (sodium pentaborate) can be included in sprays at the pre-pink with any of these materials: liquid lime-sulfur, Karathane, polysulfide compound and Orthorix. Efficiency of the mildew sprays were not appreciably decreased.

Polybor is applied in north central Washington for a serious boron deficiency on apple, usually at the first or second cover spray and a grant-in-aid from Pacific Coast Borax Co. provided for investigation of compatibility with mildew control materials.

Thimet-American Cyanamid Systemic

Thimet, a new systematic insecticide from American Cyanamid, is the first such material for application to seeds which enables the plant to kill feeding insects. Tests have shown that when cottonseed is treated, the insecticide continues to kill insects for periods up to nine weeks after the plant has emerged.

An organic phosphate originally designated Experimental Compound 3911, it is 0,0 diethyl S-isopropylmercaptomethyl dithiophosphate. Treatment, said company, will add about three dollars per acre to the cost of untreated cottonseed but would replace the two to four sprays now applied to young plants.

Limited marketing may be possible during the 1956 season through cottonseed dealers in Texas and Mississippi. Promising results are reported on both seed treatment and spray application on corn, peas, beans, lettuce, beets, peanuts, potatoes, tree fruits and tobacco seedlings.

Bait Stations for Farm Fly Control

Bait stations for fly control look promising according to J. C. Keller, H. G. Wilson and Carroll N. Smith, USDA entomologists at Orlando, Fla. Generally favorable results are reported in dairy barns, poultry houses, hog pens, feed lots and on livestock farms.

Malathion, chlorothion, American Cyanamid 4124 and L 13/59 were effective in 2 per cent concentrations, remaining toxic for weeks rather than days when mixed with a bait and concentrated on a small surface.

The stations consisted of screen wire (4 x 6 inches) covered with a slurry of bait (mixture of sugar, agar, sand and insecticide) attached to a stick or stapled to a fence post or other structure.

PEST REPORTS

Presented in cooperation with the Economic Insect Survey Section, Plant Pest Control Branch, Agricultural Research Service, USDA.

Look for Severe 'Hopper Problem

THE cooperative grasshopper adult and egg survey conducted during the late summer and fall has been completed for 1955. The 1956 rangeland grasshopper problem is expected to be more widespread and severe in the southwest than at any time in recent years.

It is expected that approximately 20,375,000 acres of rangeland in 16 Western States will carry grasshopper infestations sufficient to require control. This is a considerable increase over the 6,000,000 acres which were in the preliminary estimate for the 1955 control season.

The estimated infestation of rangeland acreage for 1956 by

States is as follows: Arizona, 140,000; California, 1,309,000; Colorado, 925,000; Idaho, 112,000; Kansas, 1,198,000; Missouri, 11,000; Montana, 1,354,000; Nebraska, 1,000,000; Nevada, 20,000; New Mexico, 2,801,000 (including nearly 98,000 of crop land); Oklahoma, 1,944,000; Oregon, 422,000; Texas, 8,747,000; Utah, 50,000; Washington, 40,000 and Wyoming, 300,000.

Final determination of the acreage of range to be treated will be made by nymphal survey in the spring. Cropland infestations are expected to be generally more threatening than during the 1955 control season.

The Mormon cricket infesta-

tions which are confined to six states, Idaho, Utah, Nevada, Colorado, Wyoming and Montana, approximate 180,000 acres of which 100,000 are expected to require treatment. This figure varies little from the 95,000 acres which were treated during the 1955 control season.

Boll Weevil Counts High

Boll weevil hibernation surveys conducted by cooperating state and Federal agencies in Madison, parish, La., and Florence county, S. C., record highest counts since this type of survey was begun in the respective States.

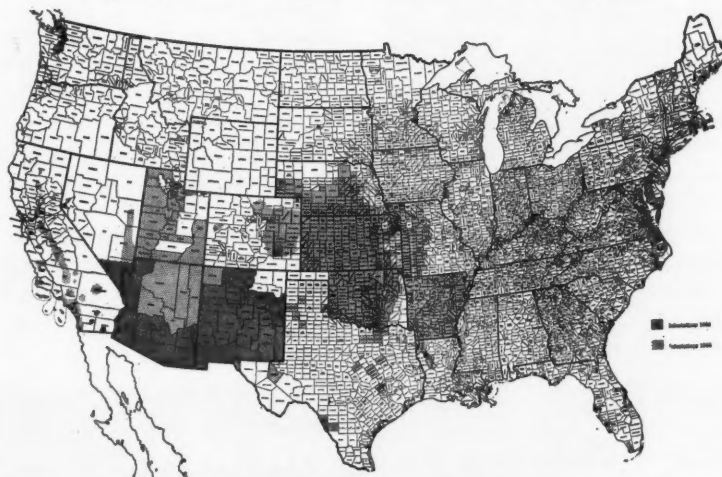
Louisiana Survey

In Louisiana the survey, which is conducted by collecting woods trash adjacent to cotton fields, was started Nov. 7 and completed Nov. 21. An average of 13,443 live weevils per acre was found in the 200 (two square yards) samples collected in Madison parish.

This was 5.7 times the average number recorded for the parish during the past 19 years. The number is 2.6 times the number found during the fall of 1953 which was the previous high year for the period and is five times the number found during the fall of 1954.

Although weather and other factors will determine the number of weevils coming out of hibernation next spring the following fall hibernation figures for the past ten years should prove interesting for study: 1946-47, 2,698 weevils per acre; 1947-48, 1,178; 1948-49, 2,146; 1949-50, 3,231; 1950-51, 4,586; 1951-52, 1,367; 1952-53, 1,295; 1953-54,

Spread of Spotted Alfalfa Aphid



Prepared by Econ Ins Serv Sect PPC ARS USDA Dec. 1955. Compiled from special state reports and from ARS files. Records are from alfalfa only, as far as known.

This map shows rather graphically the spread of the spotted alfalfa aphid which was first reported from New Mexico in February, 1954. Representing information obtainable through Dec. 9, it shows rather marked spread in Missouri since the Dec., 1954 report in FARM CHEMICALS.

5,239; 1954-55, 2,686 and 1955-56, 13,443.

In eight additional parishes, St. Landry, Avoyelles, Rapides, Natchitoches, Red River, Bossier, Ouachita and Tensas, 130 samples were collected with an average of 3,742 boll weevils per acre being found. Of these eight parishes, samples were collected in five of them in the fall of 1954. The 1955 counts are 1.8 times those of last fall. The average for all 330 samples collected in Louisiana this fall is 9,621 live weevils per acre.

Florence Co., S. C.

During the second week of November, 200 square yards of surface woods trash were examined from 20 farms in Florence county, S. C. Live boll weevils found averaged 11,398 per acre which was 4.9 times the average for the fall of 1954 and 2.3 times the average for the 13-year period records have been maintained.

The average counts for the past nine years in Florence County are as follows: 1947-48, 3,974 boll weevils per acre; 1948-49, 3,969; 1949-50, 10,744; 1950-51, 4,816; 1951-52, 1,573; 1952-53, 6,259; 1953-54, 3,533; 1954-55, 2,299 and 1955, 11,398.

Three hundred square yards of surface trash were collected in the counties of Darlington, Sumter, Clarendon, Laurens, Horry and Orangeburg. The average number of weevils per acre in these counties was 8,260 or 5.5 the number found in the fall of 1955.

Southern Virginia

The cooperative agencies collected and processed 200 square yards of surface woods trash in southern Virginia. Samples were collected from five farms in each of four counties. In three of these counties, Southampton, Brunswick and Mecklenburg, the 1955 average was slightly below that of 1954 being 1,484 and 1,791, respectively.

Figures are not available for 1954 in Nansemond county, but the average hibernating weevils per acre for the 1955 fall survey was 1,452.

Fall hibernating boll weevil surveys are also being conducted in other cotton growing states and next spring a survey will be conducted to determine the percentage of survival.

Indiana Chinch Bug Threat

Chinch bugs which threatened but did not materialize in Indiana may cause trouble this year. Many bugs are reported in hibernation in some regions, and with favorable conditions during the spring, they could be major pests.

Cyst Nematode Surveyed in N. C.

Occurrence of the soybean cyst nematode is being surveyed in North Carolina. Officials have been asked to report unexplained damage to soybean plantings and if positive reports are obtained intensive surveys of suspected areas are planned.

Pink Bollworm Study by USDA

It is believed by USDA entomologists that pink-bollworm moths from the Bahama Islands are carried nearly every year by wind across the Florida Straits, to reinfest wild cotton plants. Repeated annual clean-ups have eradicated the pest from most or all areas of southern Florida at one time or another,

and infested wild cotton is now found only on the state's southern tip.

A survey this fall showed infested plants on New Providence Island, less than an hour flight from Miami, and on Eleuthera Island of the Bahamas. It was noted that buildup in January through April in the Bahamas corresponds to the period when the pest is found in Florida's wild cotton.

It is also possible that they may breed in southern Cuba and drift north to Florida although no recent surveys have been made to determine the extent of infestation there.

Forest Insects Active in Utah

The black hills beetle is reported still active in ponderosa pine stands of the Dixie National Forest and Bryce Canyon National Park. Although control measures reduced populations in areas where applied, new infestations appeared.

Another forest pest in Utah reported on the increase in these two areas is a fir needle miner. About 10,000 acres are now infested and the trend is toward increasing severity. In the Fishlake and Dixie National Forests, a mealybug is active on 60,000 acres of Englemann spruce affecting reproduction, poles and sawtimber. Infestations are said to be increasing in extent and severity.

Many fir stands are also affected by the douglas-fir beetle and, although infestations are spotty, they are widely distributed. ▲

Polio
isn't
licked
yet!

Join the
MARCH OF DIMES
January 3 to 31

by Dr. Melvin Nord

In preparing natural phosphates for agricultural use, the predominant method is to convert the insoluble tribasic phosphate into the soluble monobasic form by interaction with sulfuric acid. The gypsum formed in this reaction may either be left as an ingredient of the final product or removed as insoluble when the material is leached with water. Upon evaporation, the leach solution becomes the so-called "triple strength" superphosphate of commerce; without such treatment it is generally designated as "superphosphate."

The process is shown in the flow diagram with basic slag as the raw material.

This slurry is separated into its soluble and insoluble components by means of a filter. Prior to such separation, SO_2 and NH_3 are

The filtrate is now evaporated and cooled, yielding crystals of ammonium sulfate and sulfates of Mn, Fe, Al and Mg. There will also be a mixture of "alums," double salts of ammonium and the heavier metals, including aluminum.

acid product, as the mother liquor, as high in phosphoric acid product and low in sulfates as is compatible with a commercial operation. In most cases this will require a two-step crystallization with intermediate mother liquor evaporation before the last crystallizing step.

Also shown is an alternate step for converting the liquid phosphoric acid into a solid form, neutralization with NH_3 and crystallization as ammonium phosphate. The mother liquor from this crystallization is returned to the circuit after a purification and concentration by evaporation. The purification would be done in



the same manner as will be described for the crystals of ammonium sulfate and alums obtained at an earlier stage in the process.

Crystals separated from the phosphoric acid mother liquor are now dissolved in water and oxidized with air until the ferrous iron has been substantially converted to the ferric form and then precipitated by the addition of ammonia as ferric hydroxide. A convenient device for this entire operation is the pachuca tank, but any other type of aerator could be substituted.

After such combined treatment, the magma is filtered, yielding a filter cake of ferric hydroxide (with some alumina) and a relatively iron-free solution for the next step. This consists of precipitating with a carbonated form of ammonia all metals that can be separated by such means. The metallic carbonates thus obtained are easily separated by filtration, and the resultant filtrate will consist essentially of ammonium sulfate.

The filtrate is dehydrated and then heated until substantially decomposed into the bisulfate and ammonia gas both of which are used again. The bisulfate is recycled directly to the head of the process, the ammonia used where called for.

Low Volatile Herbicides

U. S. 2,719,783 and 2,719,784, issued Oct. 4, 1955 to Gustave K. Kohn and assigned to California Spray-Chemical Corp., describe low volatile herbicidal compositions useful for selective control and destruction of undesired plants.

The improved herbicidal agents are the tetrahydrofurfuryl ester of 2,4-dichlorophenoxyacetic acid and of 2,4,5-trichlorophenoxyacetic acid. These compounds have low vapor pressures and also have the advantage of allowing production of concentrates of maximum parent acid composition. ▲

Research

Hopper Diet Study Gives Control Clue

Preference of the migratory grasshopper for hedge mustard over alfalfa may be a clue to controlling the pest in large alfalfa-producing areas. Tests by USDA researchers at Tempe, Ariz., have shown that the 'hopper might not be able to maintain itself through many generations of alfalfa alone.

Dietary studies showed that adults reared exclusively on hedge mustard developed large bodies, with wings proportionally longer, resembling the destructive and highly migratory Rocky Mountain grasshopper. Alfalfa produced the smallest adults of all food plants tested including hedge mustard, Johnson grass, nettle-leaf goosefoot and mixtures of these weeds with alfalfa.

A diet of hedge mustard also produced adult hoppers that laid more eggs than those fed with other foods and resulted in more than five times the survival rate of alfalfa. Longevity was greatest for adults reared exclusively on hedge mustard, with alfalfa next.

Repeat Sprays for Wild Garlic Control

Clemson tests show that 2 applications of 2,4-D a year for two to four years are needed to control wild garlic in permanent pastures. One spraying may kill the growing plant but will not kill the dormant bulblet.

Earworm Resistant Corn Studied in Mo.

The Missouri AES believes it possible to develop a corn strain that will defend itself against the corn earworm. Experimental work has shown that resistant strains not only keep worms out of the corn by a long tight silk channel within heavy husks, extending well beyond the end of the

cob, but that silks of resistant types seem to lack something required by the worms.

It was found that the longer the larva is delayed in the silk channel, the less chance it has to damage the grain. In 10-13 days from hatching, the earworm must drop to the ground and pupate.

Coastal-Bermuda Grass Feeding Pays

Fertilization of Coastal-Bermuda grasses to provide extra grazing can be profitable to Southeastern farmers, according to USDA.

Glenn W. Burton found in tests at Tifton, Ga., that nitrate of soda and ammonium nitrate were the most effective nitrogen sources and that for top yield, succulence and protein content, N applications should be split to take advantage of spring and early summer moisture.

N. C. Releases New Resistant Tobacco

A new variety of flue-cured tobacco, Dixie Bright 244, has been released by USDA and the North Carolina AES. Highly resistant to fusarium and bacterial wilt, it is also moderately resistant to black shank.

It was reported that the supply of seed available for farmers through the N. C. Crop Improvement Association will be adequate to meet anticipated needs for the 1956 season.

Antibiotic Controls Sesame Leaf Spot

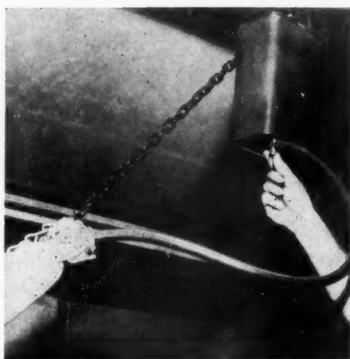
Streptomycin will control bacterial leaf spot of sesame, reported USDA's C. A. Thomas at the American Phytopathological Society meeting in Atlanta, last month. Further studies are expected to determine the most effective methods of treatment, and practical control would be an important step in advancement of the plant as an American oil seed crop.

Equipment & Supplies

Yuille Markets New Cattle Rubber Unit

Cattle rubber devices have been enthusiastically received, according to Yuille Farm Chemical Co. and the firm is now marketing an automatic device retailing at \$15.95 in most areas.

A one gallon storage tank equipped with a convenient needle



valve is used to place the insecticide inside the applicator where the material filters out as the rubber is used.

Three to four gallons per year will service one applicator, effectively treating 60 head of livestock during the period. For more data

Circle 27 on Service Card

Reinforcing Strips For St. Regis Bags

Structural strips are used to reinforce gusset areas and edges of multiwall bags in a new principle of construction developed by St. Regis Paper Co. to provide strength where it is most needed.

Reinforcement of gusset areas is accomplished by placing structural strips of kraft paper between two walls of heavy duty multiwalls. For a sack comparable to a five-ply unit, one strip is placed in each gusset of a four-ply bag,

reducing the amount of paper used without sacrifice of performance and at a saving.

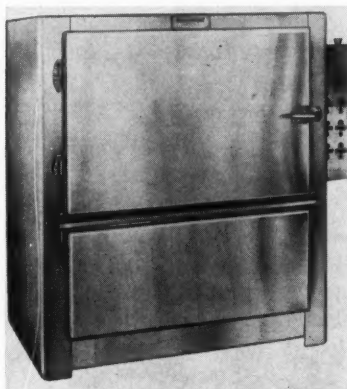
The same results are obtained for a bag comparable to a six-ply unit through reinforcement of a five-ply bag. No glueing is required on valve bags but the strips are spot pasted in sewn open mouth types to prevent shifting.

Reducing the amount of paper required, says St. Regis, can result in savings of from five to 15 per cent of the cost of the bag. For more information: **circle 28 on Service Card.**

Weather-Lab Test Units Redesigned

Weather-Lab environmental test chambers have been restyled and redesigned by Hudson Bay. Available in four sizes, from 10 to 40 cu. ft. working space with temperatures from 30 to 200° F and from 20 to 95 per cent relative humidity, they are packaged units ready for installation.

Stainless steel inside and out, the Weather-Labs include built-



in refrigeration, lights, wet and dry bulb thermostats, electric heaters and blowers and vapor-sealed insulation.

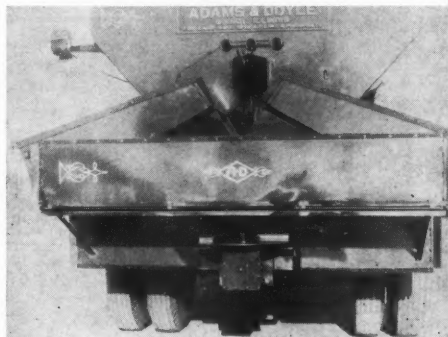
For a new bulletin

Circle 29 on Service Card

National Distribution For A & D Spreaders

National distribution of Adams & Doyle fertilizer, lime and phosphate spreaders has been announced. Already marketed in the Midwest the units include a spreader body that has been field tested for over three years.

Special features of the spreaders are the precision built gear box with spiral gears, hardened



steel shafting, 11 gauge steel sheets in sides and ends and a design that permits material to be directly dropped into the "eye" of the fan for more uniform and wider swath.

They are available in 7, 8, 10 and 12 ft. sizes with a feed gate that can be set for 100 lbs. to four tons per acre. For a brochure:

Circle 30 on Service Card

Nylon Fittings for Plastic, Metal Tubes

Nylo-Seal tube fittings, molded from DuPont nylon, for use with plastic or metal tubing are now produced by Imperial Brass Mfg. Impervious to most acids and alkalis they withstand a wide range of temperatures and offer recommended working pressures from 150 to 500 psi.

The units are two piece fittings with the sleeve an integral part of the nut. To make a joint, tubing is inserted into the body of the fitting and the nut is tightened. For a brochure

Circle 31 on Service Card

FOR SALE

FOR IMMEDIATE DELIVERY:

Broadfield Den, 8 and 6 hopper
Inglett & Corley batching machines;
65-foot unloading conveyor; nu-
merous other machines for fertilizer
manufacture; also Hough Payloaders.

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P. O. BOX 904

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Telephone LD 909

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minimum. Count box number
as five words.

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umn inch, minimum of one

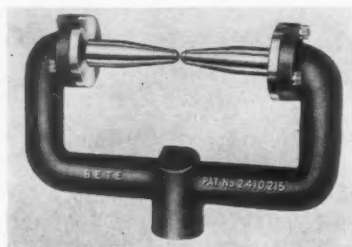
inch. Ads over the minimum
are accepted only in multiples
of one half inch.

For prompt results, send
your classified ads to Farm
Chemicals, 317 N. Broad St.,
Philadelphia 7, Pa.

Closing date: 10th
of preceding month

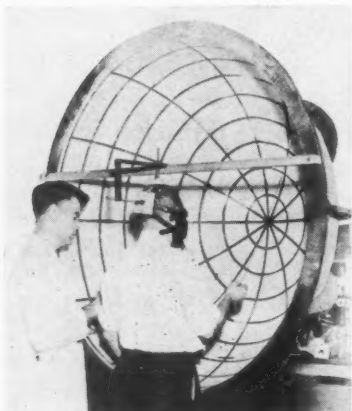
New O. J. Nozzle Series by Bete Fog

Bete Fog Nozzle has released a
new line of opposed jet impinge-



ment type nozzles said to pro-
vide a more uniform drop size

Acme Vision Scope



This Vision Scope is used by Acme
Protection Equipment to check all
ranges of vision angles for both
single and double lens types of gas
masks. A special bulletin is avail-
able presenting the comparative
maximum usable vision patterns
of leading makes of gas mask
equipment. For a copy

Circle 32 on Service Card

than conventional units with
highest possible efficiency of
atomization.

The O. J. series is available in
four standard sizes in bronze and
aluminum or, on special order in
stainless steel and other mate-
rials. For more information
Circle 33 Service Card

Suppliers' Briefs

Arkell & Smiths. Two new
sales representatives have joined
the flexible packaging division,
Harold J. Schneider in Philadel-
phia and Lysander (Sandy) Rich-
mond at Boston, covering the
New England area.

Tom L. Jones has been ap-
pointed a vice-president of the
concern and will be in charge of
the eastern sales division with
offices in NYC.

Bemis Bro. Bag Co. has
opened a paper specialty depart-
ment at the Wilmington, Calif.
plant—the first such Bemis opera-
tion on the West Coast.

Blaw Knox Co. New division
vice-presidents of the chemical
plants division are Arne O. Olson,
engineering; Keator McCubbin,
v-p and general manager, Chi-
cago; Charles F. Hauck, sales; and
Ed. S. Wright, construction.

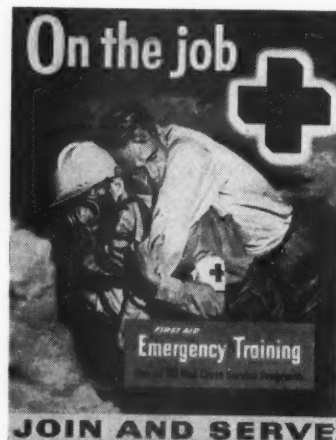
Link-Belt Co. has named Wm.
H. Depperman to the new post of
director of public relations.

Napco Industries, Inc. Derek
S. Brown is now director of per-
sonnel for the firm's five divisions.

Raymond Bag Co. is now
operated as a wholly owned sub-
sidiary of The Albemarle Paper
Mfg. Co., Richmond, Va. It will
retain its identity, and present
personnel will remain intact.

The change was aimed at mak-
ing Raymond part of an inte-
grated operation with Albemarle
pulp and paper mills and kraft and
specialty paper units supplying
Raymond multiwall bag facilities.

St. Regis Paper Co. has ac-
quired from Growers' Container
Corp., Salinas, Calif., for cash, an
authorized but unissued block of
stock representing about 40 per
cent interest in the firm.



FARM CHEMICALS

FERTILIZER MATERIALS MARKET

New York

December 12, 1955

Sulfate of Ammonia. Some producers are concerned with heavy stocks on hand at production points and movement is said to be slow. While no price reductions have been reported, it is feared some producers may take some drastic action to move their present accumulation. Recent export inquiries have not produced much business.

Ammonium Nitrate. Most producers are faced with the same problem as the sulfate of ammonia producers and are finding it difficult to find buyers to take delivery at this time. With the heavy shipping season at least 60 days away, some trade authorities look for slightly lower prices.

Urea. Demand from the fertilizer trade at the present time was small, but industrial buyers were said to be taking larger quantities. Because of the domestic price, very little imported material is available to compete with domestic trade.

Nitrogenous Tankage. The movement of this material was described as poor at the present time with little inquiry for quick shipment. Prices remained at \$4 to \$5.10 per unit of ammonia (\$4.86 to \$6.20 per unit N), according to shipping point. Imported material was priced at high levels with no business being done.

Castor Pomace. Castor pomace still remained scarce and in short supply, and when sales were made they were done at the price of \$40 per ton, f.o.b. production points.

Organics. Organic materials showed a slightly firmer tendency price-wise, with soybean meal quoted at about \$2 per ton above the low price it set recently. Last sales were made on the basis of

\$47 per ton, f.o.b. Decatur, Ill., and futures were quoted at about \$50 per ton. Linseed meal was quiet and cottonseed meal was slightly firmer in price with export demand reported better. Last sales on the basis of \$55 per ton, f.o.b. Memphis. Tankage sold at \$4.25 per unit of ammonia (\$5.16 per unit N), f.o.b. New York, and blood was quoted at \$5 (\$6.08 per unit N), f.o.b. New York.

Fish Meal. Because of recent heavy imports, fishmeal eased up slightly in price but domestic menhaden fish meal remained firm and difficult to locate. The market was said to be \$155 to \$160 f.o.b. Eastern shipping points.

Bone Meal. Bone meal was in fair demand from both the fertilizer and feed trade and prices remained stable at \$65 to \$67 per ton, f.o.b. shipping points. Very little foreign material has arrived recently. Last sales of imported feeding grade were made on the basis of \$65 per ton, f.o.b. ports.

Hoof Meal. Some recent sales were made on the basis of \$6 per unit of ammonia (\$7.29 per unit N), f.o.b. Chicago, but offerings seem to be scarce.

Superphosphate. A routine affair was noted in this market with stocks adequate at all points. Some small export demand was noted.

Potash. While shipments continued on contracts, some of the larger buyers were said to be taking delivery rather slowly for this time of year.

Philadelphia

December 12, 1955

The raw materials market is still very slow with large inventories accumulating and buyers expecting lower prices in consequence. Fish meal is the exception

and keeps high. The box-car shortage which existed in some areas seems to have been overcome.

Sulfate of Ammonia. Stocks continue to increase and inventories are considerably larger than at the same time last year. This applies particularly to coke-oven grade. A very slight increase in domestic demand is reported.

Nitrate of Ammonia. Although production is somewhat reduced, the material is in plentiful supply. Demand is rather slow.

Nitrate of Soda. Supplies arrive regularly from Chile, and stocks are fully able to meet all requirements. Movement is limited, and there are no price changes reported.

Blood, Tankage, Bone. Blood and tankage command very little interest at present. Prices range from \$4 to \$4.50 per unit ammonia (\$4.86 to \$5.47 per unit N) in the East, and \$4.50 to \$4.75 (\$5.47 to \$5.77 per unit N) in the Chicago area. Steamed bone meal is quoted at \$65 per ton.

Fish Scrap. Menhaden meal is held firm at \$156 per ton, although the demand is rather easy. Considerable meal has been imported but buyers show little interest in it.

Phosphate Rock. While export business is very poor, there is fair domestic movement. Producers have still not increased prices to cover recent increased costs.

Superphosphate. There are ample stocks on hand and prices have not been changed. Demand is reported slightly improved.

Potash. The shortage of empty cars has been relieved, and this has eased the storage situation. There is some movement to mixers, but the volume is not wholly satisfactory.

Statistics

Potash Output at New High in 1954

Another record in US production of marketable potassium salts was set in 1954 with output of 3,322,395 tons representing a two per cent increase over 1953.

Sales and apparent consumption both increased, 10 and 8 per cent respectively, compared with 1953, and stocks in producers hands at the end of the year (524,328 tons) were up 11 per cent.

Imports during the year, totaling 225,230 tons, dropped 10 per cent while exports of 117,386 tons represented a 33 per cent increase. West Germany, East Germany, France, Spain and Chile, respectively, supplied 41, 22, 15, 11 and 6 per cent of imports while Western hemisphere countries received most of the exported material.

New Mexico, California and Utah continued to supply most of the domestic production and 91 per cent came from New Mexico.

Kentucky 6-month Fert. Consumption

In Kentucky, the Department of Feed and Fertilizer, University of Kentucky, reports that fertilizer tonnage during July-October, 1955, seems to have gained over the 1954 period with mixed goods accounting for any increase. Tonnage of 4-12-8, leading grade for the period, more than doubled over 1954 while 3-12-12 slipped to second place.

Total sales of mixed goods amounted to 49,029 in 1955, 46,381 in 1954 and straight materials were 19,324 and 19,069 respectively.

The department states that about 70 per cent of "fall" fertilizer is sold during this four month period with 32 per cent of the sales occurring in October.

Gains in Sept. Super Output, Shipments

During September superphosphate production rose to 182,093 tons (100 per cent APA), 33 per cent above August, which still felt effects of the phosphate rock strike, and 14 per cent above September, 1954.

Shipments of all grades totaled 116,167 tons, up 30 and seven per cent respectively. Stocks on hand at the end of the month were five per cent more than those held on September 30, 1954 and three per cent above August 31, 1955.

Quarterly Report On Cal. Fert. Sales

California's Bureau of Chemistry reports sales of 183,411 tons of fertilizer during the third quarter of 1955, 37,787 tons in mixed dry form and 36,229 tons as 20-0-0 solution.

Production — September, 1955

Compiled from Government Sources

Chemical	Unit	September		August
		1955	1954	1955
Ammonia, synth. anhydrous.....	s. tons	231,776	210,938	237,202
Ammonia liquor, coal & coke (NH ₃ content).....	pounds	4,110,264	2,406,700	3,911,378
†Ammonium nitrate, fert. grade (100% NH ₄ NO ₃).....	s. tons	112,935	129,915	121,978
Ammonium sulfate				
synthetic (technical).....	s. tons	77,133	92,201	82,453
coke oven by-product.....	pounds	162,468,671	126,982,500	161,366,674
BHC (Hexachlorocyclohexane).....	pounds	6,492,307	**2,609,094	7,838,836
Gamma content.....	pounds	1,071,258	**490,863	1,302,785
Copper sulfate (gross).....	s. tons	6,832	5,928	7,076
DDT.....	pounds	10,190,027	**6,444,083	11,276,953
2,4-D Acid.....	pounds	2,963,325		1,800,337
esters and salts.....	pounds	1,660,774	**1,085,204	**2,264,229
esters and salts (acid equiv.).....	pounds	1,315,979	**759,072	**1,618,815
Phosphoric acid (50% H ₃ PO ₄).....	s. tons	316,745	219,823	244,502
Sulfur, Native (Frasch).....	l. tons	498,591	439,244	500,710
Recovered.....	l. tons	30,800	27,300	34,500
Sulfuric acid, gross (100% H ₂ SO ₄).....	s. tons	1,257,738	1,120,743	1,202,169
Chamber process (100% H ₂ SO ₄).....	s. tons	176,877	200,670	147,436
Contact process (100% H ₂ SO ₄).....	s. tons	1,080,861	920,073	1,054,733
Superphosphate (100% APA).....	s. tons	182,093	159,330	*136,990
Normal (100% APA).....	s. tons	121,107	117,617	*98,008
Enriched (100% APA).....	s. tons	3,179	2,455	*3,426
Concentrated (100% APA).....	s. tons	57,379	38,773	35,223
Wet Base (100% APA).....	s. tons	428	485	333
2,4,5-T Acid.....	pounds	86,789		111,072

* Revised.

** Partly estimated.

† Includes quantities for 1 plant previously not reporting.

† Includes NH₃ content of diammon. phosphate & ammon. thiocyanate.

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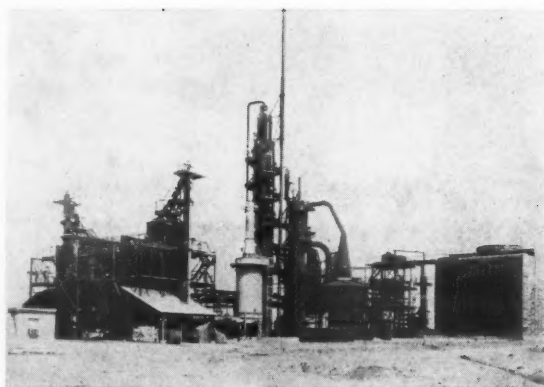
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FEEDING AND FERTILIZER MATERIALS

(SINCE 1898)

SAMUEL D. KEIM

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PHILADELPHIA 7, PA.



The Wisconsin process plant, Sunflower Ordnance Works, Lawrence, Kan., built and operated for 18 mo. by FMC.

Wisc. Process For N Fixation

OPERATION of the much discussed Wisconsin process for nitrogen fixation was reviewed in a recent symposium sponsored jointly by Food Machinery & Chemical Corp. and Wisconsin Alumni Research Foundation. The two organizations co-operated in development of the process and FMC built and operated, for 18 months, a 40 ton per day plant at Sunflower Ordnance Works, Lawrence, Kansas.

In early work on high temperature fixation of nitrogen to yield oxides of nitrogen and nitric acid, conducted at the University of Wisconsin, it was found that temperature of the order of 3900° F could be achieved and good yields of nitric oxide could be obtained in a regenerative pebble-bed furnace.

In 1946, FMC assumed responsibility for development of a large scale process and, following a number of unsuccessful pilot furnaces, the moving bed principle was developed. This eliminated the sintering and plugging problem inherent in fixed refractory pebble beds.

Satisfactory nitric oxide yields were obtained in this unit and a suspended arch furnace served for a year at temperatures above 3800° F with an estimated life of several additional years.

The Sunflower plant also utilized a University of Wisconsin recovery system based on silica gel. Fluidized silica gel tray towers were used for concentration of the dilute oxides of nitrogen.

Following production of 2,400 tons of equivalent 100 per cent nitric acid, and collection of all important data, the semi-commercial Sunflower unit was closed. Further development, says FMC, will be required to realize the economic advantages of this process for large scale use. ▲

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Subsidiary of United Engineering and Foundry Company
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SUPERPHOSPHATE
UREA, 45½% & 46% N.
DI-N-CAL — 20.5% N.
(Calcium Ammonium Nitrate)
BAGS —
Paper and Burlap

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editorial

Superior Merchandising

MERCHANDISING, superior merchandising, involves generally six basic steps—market survey, product development, mapping of sales policies, advertising and promotion, training of salesmen and field service. These, as pointed out by DuPont's advertising head Wallace E. Gordon in his talk before the Southern Seedman's Association, are not exact titles and are used only as a convenience in discussing merchandising activities.

We will review some of his remarks and add a few of our own not with the idea of providing a course in Gordon's "Superior Merchandising for Superior Profits" philosophy, but as a check list for your activities and those of your distributors and dealers.

The advertising and promotion phase, said Gordon, requires careful selection of media, and expenditures should be considered an investment toward future sales. With each ad or mailing piece you will want to reach a maximum number of customers with the least waste, timing it "to reach your customer while he's still making up his mind."

If most customers are orchardists or cotton growers there is little to be gained in telling them about the material you now have for control of pasture insects or a vegetable disease. On the other hand, when pushing a product of interest to a relatively few customers, paying to advertise to your entire sales field doesn't constitute a good investment. This general idea, of course, depends on available media and, on a local or a county basis, may be impossible to follow with advertising space. It could be done with promotional and mailing pieces when well organized lists have been set up.

AT BOTH your level and among dealers, demonstrations can play an important part in sales promotion. A plot of ground fertilized according to specifications with your new high analysis mixed goods or anhydrous ammonia from a new bulk station can be a graphic demonstration to visiting farmers.

Field trials have also proved most valuable and, with the aid of a cooperative farmer, even greater gains might be realized from this type of exhibit. A small sign will tell the story to passing farmers and there may be a definite advantage in having such a demonstration on private ground away from the plant or store location.

Training of salesmen is of prime importance, continued Gordon; they must believe in the products they sell and the company they represent and be capable of completing a transaction that will benefit

both the customer and seller, a sale that will assure a satisfied and steady customer.

If you sell through dealers, it is rarely sufficient to train only your own salesmen—these dealers and their clerks are the ones that do the actual selling job and should be capable of carrying this out as well as a member of your own staff. Take the time and make the effort to be sure that these people know your company, your products and their application and the proper use of farm chemicals.

When the customer is misinformed or sold the wrong material not only the dealer loses, but your product and sales are directly affected.

In our industry, field service of many firms ranks very high with well qualified men assisting the farm customer in his problems of plant fertilization, soils and pest control. The assistance rendered means a satisfied customer—one who returns each season for both materials and advice—one who is relatively stable and unaffected by the overtures of price-cutters and other forms of questionable competition.

Through these service calls, Gordon pointed out, you can also get new leads on customer needs, perhaps improvements in existing products, additions to your product line or even a brand new approach to sales promotion and advertising.

He emphasized the value of foreseeing needs, not waiting until customers demand certain products. Greater service is rendered and certainly a greater return is possible when this need or desire is promptly met with a product at a price determined by its value to the buyer, its costs and the contribution made by the seller.

If, after careful study, a prospective material or new idea still looks good, the market survey is used to determine its potential, followed by the other steps of development, selling, promotion and servicing.

THE ad executive had a few comments that appear to be of primary interest to the dealer and distributor segments of this industry. He emphasized that it pays to be selective in the products that are stocked and sold. Concentrating on one good line is true superior merchandising and, if you are successful, leads to superior profits.

It costs more to carry two lines than one, Gordon continued, and everyone profits, including the customer, when one top line is selected and pushed. "The product which will show the best pay-off in farm production," he added, "will also be the most profitable for you."

Half of the task of developing a sales policy, said Gordon, is in choosing the right products and suitable allied lines. The other half is choosing the methods and themes by which customers are persuaded it's to their advantage to buy from you.

G. P. T., Jr.
Editor

FARM CHEMICALS

Buyers' Guide

Classified Index to Advertisers in 'Farm Chemicals'

ALDRIN

Ashcraft-Wilkinson Co., Atlanta, Ga.
Shell Chemical Co., Agr. Chem. Div., Denver, Colo.

AMMONIA—Anhydrous and Liquor

Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corporation, New York City
Escambia Bay Chem. Corp., Pensacola, Fla.
Grand River Chem. Div., Deere & Co., Tulsa, Okla.
Lion Oil Co., El Dorado, Ark.
Mississippi River Chem. Co., St. Louis, Mo.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Sohio Chemical Co., Lima, O.

AMMONIA CONVERTER

J. C. Carlile, Corp., Denver, Colo.

AMMONIUM NITRATE

Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corporation, New York City
Escambia Bay Chem. Corp., Pensacola, Fla.
Lion Oil Co., El Dorado, Ark.
Mississippi River Chem. Co., St. Louis, Mo.
Phillips Chemical Co., Bartlesville, Okla.

AMMONIUM SULFATE

See Sulfate of Ammonia

AMMONIUM SULFATE NITRATE

Atkins, Kroll & Co., San Francisco, Calif.

BAGS—BURLAP

Chase Bag Co., Chicago, Ill.

BAGS—COTTON

Chase Bag Co., Chicago, Ill.

APPLICATORS—Ammonia

KBH Corp., Clarksdale, Miss.

APPLICATORS—Liquid Fertilizer

Krause Plow Corp., Hutchinson, Kan.

BAGS—Multiwall-Paper

Chase Bag Co., Chicago, Ill.
International Paper Co., Bagpak Div., N. Y. C.
Hammond Bag & Paper Co., Wellsburg, W. Va.
Kraft Bag Corporation, New York City
Union Bag & Paper Corp., New York City

BAGS—Dealers and Brokers

Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

BAG CLOSING MACHINES

International Paper Co., Bagpak Div., N. Y. C.

BAG PRINTING MACHINES

Schmutz Mfg., Louisville, Ky.

BAG FILLING MACHINES

E. D. Coddington Mfg. Co., Milwaukee, Wisc.
Stedman Foundry and Machine Co., Aurora, Ind.
Union Bag & Paper Corp., New York City

BHC AND LINDANE

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pennsylvania Salt Mfg. Co., of Wash., Tacoma, Wash.

BIN LEVEL CONTROLS

Stephens-Adamson Mfg. Co., Aurora, Ill.

BIN DISCHARGERS

Stephens-Adamson Mfg. Co., Aurora, Ill.

BONE PRODUCTS

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackie, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

BORAX AND BORIC ACID

American Potash & Chemical Corp., Los Angeles, California
Woodward & Dickerson, Inc., Philadelphia, Pa.

BOX CAR LOADERS

Stephens-Adamson Mfg. Co., Aurora, Ill.

BROKERS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackie, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BULK TRANSPORTS

Highway Equipment Co., Cedar Rapids, Ia.

CALCIUM AMMONIUM NITRATE

Atkins, Kroll & Co., San Francisco, Calif.
McIver & Son, Alex. M., Charleston, S. C.
New York Hanseatic Corp., N. Y. C.

CALCIUM ARSENATE

American Agricultural Chemical Co., N. Y. C.

CALCIUM NITRATE

Atkins, Kroll & Co., San Francisco, Calif.

CAR PULLERS

Stephens-Adamson Mfg. Co., Aurora, Ill.

CARS AND CART

Atlanta Utility Works, The, East Point, Ga.
Stedman Foundry and Machine Co., Aurora, Ind.

CASTOR POMACE

Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

CHEMISTS AND ASSAYERS

Shuey & Co., Inc., Savannah, Ga.

CHLORDANE

Ashcraft-Wilkinson Co., Atlanta, Ga.

CLAY

Ashcraft-Wilkinson Co., Atlanta, Ga.

CONDITIONERS

Ashcraft-Wilkinson Co., Atlanta, Ga.
H. J. Baker & Bro., New York City
Jackie, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio

CONVEYORS

Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Sturtevant Mill Co., Boston, Mass.

COPPER SULFATE

Tennessee Corp., Atlanta, Ga.

COTTONSEED PRODUCTS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackie, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

CUSTOM PESTICIDE FORMULATION

Barco Chemicals, Inc., Des Moines, Ia.

DDT

Ashcraft-Wilkinson Co., Atlanta, Ga.

DIELDRIN

Ashcraft-Wilkinson Co., Atlanta, Ga.
Shell Chem. Corp., Agr. Chem. Div., Denver, Colo.

DILUENTS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pioneer Pyrophyllite Producers, Beverly Hills, Calif.
Summit Mining Corp., Carlisle, Pa.
Thomas Alabama Kaolin Co., Baltimore, Md.

DITHIOCARBAMATES

Berkshire Chemicals, New York City

DUST APPLICATORS

Raw Materials Trading Co., New York City

ELEVATORS

Power-Curve Conveyor Co., Denver, Colo.
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.

ENDRIN

Shell Chemical Co., Agr. Chem. Div., Denver, Colo.

ENGINEERS—Chemical and Industrial
Chemical Construction Corp., New York City
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

FERTILIZER—Liquid

Clover Chemical Co., Pittsburgh, Pa.

FERTILIZER—Mixed

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Co., div. of W. R. Grace & Co., Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.

FERTILIZER—Organic

Lebanon Chemical Corp., Lebanon, Pa.

FILLERS

Bradley & Baker, N. Y. C.

FISH SCRAP AND OIL

Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackie, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

FULLER'S EARTH

Ashcraft-Wilkinson Co., Atlanta, Ga.

FUNGICIDES

American Agricultural Chemical Co., N. Y. C.
Berkshire Chemicals, New York City
Metalsalts Corp., Hawthorne, N. J.
Tennessee Corp., Atlanta, Ga.

HERBICIDES

American Potash & Chemical Corp., Los Angeles, California
Barco Chemicals, Inc., Des Moines, Ia.
Lion Oil Company, El Dorado, Ark.

HERBICIDES—Oils

Lion Oil Company, El Dorado, Ark.

HOPPERS & SPOUTS

Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

IMPORTERS, EXPORTERS

Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Berkshire Chemicals, New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

INSECTICIDES

American Agricultural Chemical Co., N. Y. C.
American Potash & Chemical Corp., Los Angeles, California
Ashcraft-Wilkinson Co., Atlanta, Ga.
Barco Chemicals, Inc., Des Moines, Ia.
Berkshire Chemicals, New York City
Fairfield Chem. Div., Food Mach. & Chem. Corp., New York City
Pennsylvania Salt Mfg. Co., of Wash., Tacoma, Wash.
Shell Chem. Corp., Agr. Chem. Div., Denver, Colo.

IRON SULFATE

Tennessee Corp., Atlanta, Ga.

KAOLIN

Thomas Alabama Kaolin Co., Baltimore, Md.

LEAD ARSENATE

American Agricultural Chemical Co., N. Y. C.

LIMESTONE

American Agricultural Chemical Co., N. Y. C.
Ashcraft-Wilkinson Co., Atlanta, Ga.
National Lime & Stone Co., Findlay, Ohio

MACHINERY—Acid Making and Handling

Chemical Construction Corp., New York City
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Acidulating

Chemical Construction Corp., New York City
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Grinding and Pulverizing

Bradley Pulverizer Co., Allentown, Pa.
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.
Williams Patent Crusher & Pulverizer Co., St. Louis, Mo.

Buyers' Guide

MACHINERY—Material Handling
Clark Equip. Co., Construction Mach. Div., Benton Harbor, Mich.
Hough, The Frank G. Co., Libertyville, Ill.
Jaeger Machine Co., Columbus, O.
Link-Belt Co., Chicago, Ill.
Poulsen Co., Los Angeles, Calif.
Power-Curve Conveyor Co., Denver, Colo.
Sauerman Bros. Inc., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Stephens-Adams Mfg. Co., Aurora, Ill.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Mixing and Blending
Munson Mill Mach. Co., Utica, N. Y.
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Mixing, Screening and Bagging
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Power Transmission
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY
Superphosphate Manufacturing
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MAGNESIUM SULFATE
Berkshire Chemicals, New York City

MANGANESE SULFATE
Tennessee Corp., Atlanta, Ga.

MANURE SALTS
Potash Co. of America, Washington, D. C.

MINOR ELEMENTS
Tennessee Corporation, Atlanta, Ga.

MIXERS
Munson Mill Mach. Co., Utica, N. Y.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

NITRATE OF POTASH
Berkshire Chemicals, New York City

NITRATE OF SODA
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
McIver & Son, Alex. M., Charleston, S. C.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
International Min. & Chem. Corp., Chicago, Ill.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NITROGEN SOLUTIONS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corporation, New York City
Escambia Bay Chem. Corp., Pensacola, Fla.
Lion Oil Company, El Dorado, Ark.
Mississippi River Chem. Co., St. Louis, Mo.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Sohio Chemical Co., Lima, O.

NITROGEN MATERIALS—Organic
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Jackie, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Smith Rowland Co., Norfolk, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NOZZLES—Spray
Monarch Mfg. Works, Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.

ORGANIC MERCURY COMPOUNDS
Metalsalts Corp., Hawthorne, N. J.

PARATHION
Ashcraft-Wilkinson Co., Atlanta, Ga.

PHOSPHATE ROCK
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

PHOSPHORIC ACID
American Agricultural Chemical Co., N. Y. C.

PLANT CONSTRUCTION—Fertilizer and Acid
Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

POTASH—Muriate
American Potash & Chemical Corp., Los Angeles, California
Ashcraft-Wilkinson Co., (Duval Potash) Atlanta, Ga.
Bradley & Baker, N. Y. C.
Duval Sulphur & Potash Co., Houston, Tex.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Potash Co. of America, Washington, D. C.
Southwest Potash Corporation, New York City
United States Potash Co., N. Y. C.

POTASH—Sulfate
American Potash & Chemical Corp., Los Angeles, California
International Min. & Chem. Corp., Chicago, Ill.
Potash Co. of America, Washington, D. C.

PRINTING PRESSES—Bag
Schmuts Mfg. Co., Louisville, Ky.

PYROPHYLLITE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Pioneer Pyrophyllite Producers, Beverly Hills, Calif.

REPAIR PARTS AND CASTINGS
Atlanta Utility Works, The, East Point, Ga.
Stedman Foundry and Machine Co., Aurora, Ind.

SCALES—Including Automatic Baggers
Atlanta Utility Works, The, East Point, Ga.
Stedman Foundry and Machine Co., Aurora, Ind.

SCRAPER MACHINES
Sauerman Bros. Inc., Chicago, Ill.

SCREENS
Atlanta Utility Works, The, East Point, Ga.
Ludlow-Saylor Wire Cloth Co., St. Louis, Mo.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.
Williams Patent Crusher & Pulverizer Co., St. Louis, Mo.

SEPARATORS, AIR
Williams Patent Crusher & Pulverizer Co., St. Louis, Mo.

SHOVEL LOADERS
Clark Equip. Co., Benton Harbor, Mich.
Hough, The Frank G. Co., Libertyville, Ill.
Jaeger Machine Co., Columbus, O.

SOLVENTS
Crowley Tar Products Co., New York City
Richfield Oil Corp., Los Angeles, Calif.

SPRAYERS
Finco, Inc., N. Aurora, Ill.

SPRAYS
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.

SPREADERS, TRUCK
Highway Equipment Co., Cedar Rapids, Ia.

STORAGE BUILDINGS
Butler Manufacturing Co., Kansas City, Mo.

STORAGE TANKS
Broadway Rubber Corp., Louisville, Ky.
Butler Manufacturing Co., Kansas City, Mo.
Cole, R. D., Manufacturing Co., Newnan, Ga.

SULFATE OF AMMONIA
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.

Bradley & Baker, N. Y. C.
Jackie, Frank R., New York City
Lion Oil Co., El Dorado, Ark.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFATE OF POTASH—MAGNESIA
International Min. & Chem. Corp., Chicago, Ill.

SULFUR
Ashcraft-Wilkinson Co., Atlanta, Ga.
Texas Gulf Sulphur Co., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFUR—Dusting & Spraying
Ashcraft-Wilkinson Co., Atlanta, Ga.
U. S. Phosphoric Products Div., Tennessee Corp., Tampa, Fla.

SULFURIC ACID
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Lion Oil Company, El Dorado, Ark.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

SUPERPHOSPHATE
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Davison Chemical Co., div. of W. R. Grace & Co., Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.
Jackie, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SUPERPHOSPHATE—Concentrated
Armour Fertilizer Works, Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TALC
Ashcraft-Wilkinson Co., Atlanta, Ga.

TANKAGE
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Jackie, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Smith-Rowland Co., Norfolk, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TANKS—NH₃ and Liquid N
Broadway Rubber Corp., Louisville, Ky.
Butler Manufacturing Co., Kansas City, Mo.
Cole, R. D., Manufacturing Co., Newnan, Ga.
KBH Corporation, Clarkdale, Miss.

TOXAPHENE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Pittsburgh Coke & Chem. Co., Agr., Chem. Div., Pittsburgh, Pa.

TRUCKS—SPREADER
Highway Equipment Co., Cedar Rapids, Ia.

UREA & UREA PRODUCTS
Atkins, Kroll & Co., San Francisco, Calif.
Bradley & Baker, N. Y. C.
Grand River Chem. Div., Deere & Co., Tulsa, Okla.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Sohio Chemical Co., Lima, O.

UREA-FORM
Nitro-form Agricultural Chemicals, Woonsocket, R. I.

VALVES
Monarch Mfg. Works, Inc., Philadelphia, Pa.

ZINC SULFATE
Tennessee Corp., Atlanta, Ga.

FARM CHEMICALS



GIANT SERVANTS OF AGRICULTURE

A series of continuous mining machines designed, developed and built by PCA's engineers literally tear ore from the earth and automatically pass it onto a panel conveyor for forwarding to the mainline belt.

Such innovations outmode conventional mining practices, increase efficiency, and insure on-time departure of shipments to our customers.



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Midwestern Sales Office . . . First National Bank Bldg., Peoria, Ill.
Southern Sales Office . . . Candler Building, Atlanta, Ga.

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AND
DOMESTIC

MATERIALS

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DUVAL GRANULAR
MURIATE OF POTASH

AMNICAL
20.5% Nitrogen
(Ammonium Nitrate Limestone)
Samples on request.



NITROGEN COMPOUNDS



SULPHUR & POTASH



ORGANIC AMMONIATES



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